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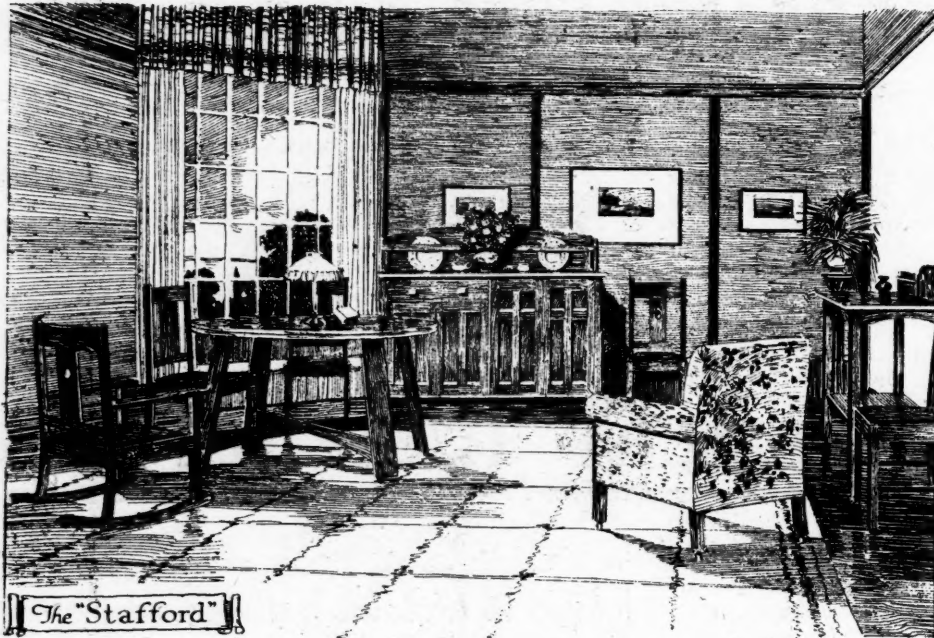
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No. 10.

THE SYMPTOMATOLOGY OF COMPLETE TRANSVERSE LESIONS OF THE SPINAL CORD.¹

By George E. Rennie, B.A. (Syd.), M.D., F.R.C.P. (Lond.),
Sydney.

Prior to the year 1890 some physicians, in describing the symptoms presented by a patient in whom there was reason to believe there existed a complete anatomical or physiological transection of the spinal cord, pointed out that the caudal segment of the divided cord not only retained its functional activity as a reflex centre provided the lesion was above the lumbar enlargement, but the reflex actions from the skin and the muscles became exaggerated after a varying time. This view, however, was attacked by Dr. Charlton Bastian in a paper on the "Symptoms of Total Transverse Lesions of the Cord" published in 1890. He laid it down as a definite conclusion from his clinical and pathological experience that the following symptoms occurred when the spinal cord was totally divided at the lower cervical and upper dorsal levels: (i.) Complete paralysis of the legs and abdominal muscles. (ii.) Loss of sensibility below the level of the lesion. (iii.) A flabby and toneless condition of the muscles. (iv.) For a long period only slight wasting of the paralysed muscles. (v.) Loss of abdominal and cremasteric reflexes and of the tendon jerks in the legs, the only response obtained being an occasional slight movement of the toes when the soles of the feet are strongly tickled. (vi.) The skin is dry and scurfy. (vii.) For the first ten to fourteen days complete retention of urine. This is followed by periodic reflex evacuation of the bladder, which is never complete, from 60 to 120 c.cm. remaining as residual after each act. The bowels are confined and are relieved only by aperients and enemata. At these times there is incontinence of fæces.

The explanation offered by Bastian for the loss of the tendon jerks was based on the view that these phenomena depend on the presence of muscle tone in the *rectus femoris* and the calf muscles, which is maintained by influences passing from the cerebellum along the efferent cerebellar tracts to the lower spinal centres; when these tracts are divided, the muscle tone is lost and the tendon reflexes fail.

Bastian's view was generally, though not universally, accepted as true for many years, though the work of Sherrington on spinal shock and the results of his experiments on animals tended materially to weaken its foundations. Nevertheless, in 1915, Dr. Gordon Holmes in his Goulstonian Lectures on "Spinal Injuries in Warfare," expressed the opinion that in total transverse lesions of the cord the knee and ankle jerks were probably permanently absent, though the response to plantar stimulation varied. In all severe cases of spinal injury he found the lower limbs to be flaccid as early as the first day after the injury and they became flabby and toneless three or four days later. If the lesion were com-

pletely transverse, the muscles remained flaccid and wasted gradually and later underwent fibrous contraction, especially those of the calf and the flexors of the toes.

It must, however, be borne in mind that these observations of Holmes were made in the early stages of the war, when he had not had the opportunity of following up his cases for any great length of time. But even in 1916 Collier in an address before the Medical Society of London agreed on the whole with Holmes's conclusions. It is only in the last two or three years that the view held by Byrom Bramwell in 1884 and supported by Gowers in his text-book in 1886 has again come to be accepted as true, *viz.*, that in complete transection of the spinal cord, provided there is no descending degeneration to the lumbar enlargement, the caudal segment retains its reflex excitability to an exaggerated degree.

It must be admitted that the one factor which appears to have been overlooked in the early days and which probably is responsible for the partially erroneous views advanced by Bastian and his followers, is "spinal shock." We owe much to Sherrington for emphasizing this important point and for his discussion as to its probable nature. We are still, of course, more or less in doubt as to its true nature, but it appears to be a condition of temporary suspension of all functional activity in the portion of the spinal cord caudal to the level of an injury or focus of disease due to the sudden interruption of impulses which normally are passing from the higher centres, possibly at the base of the brain, to the lower spinal centres. These impulses maintain a condition of permanent tone or tension, if we may use such an expression, and, just as a muscle becomes relaxed, flabby and toneless and functionally imperfect after section of its motor or sensory nerve, so the caudal segment of a severely injured or totally divided spinal cord is toneless and functionally depressed, at any rate, for a time after a sudden severe lesion of the cord. An important point in connexion with this theory of spinal shock is noted by Gordon Holmes in his lectures already referred to; that is, that the unilateral absence or depression of the knee jerks in cases of unilateral lesion shows that their abolition is not due to a state of general shock or to a sudden gross traumatic injury of the cord, but that it must be attributed to an interruption of impulses that descend through the homolateral half of the cord, thus producing a functional depression on this side only. This may not be considered a very satisfactory explanation of spinal shock; nevertheless the fact remains that for a variable period after transection of the cord, whether experimental in animals or as a result of injury or disease in man, there is a condition of defective functioning of the caudal segment. Sherrington has noted that this period increases in duration as we ascend the animal scale. In other words, the more highly specialized the brain becomes as an organ of control or inhibition or the greater the dependability of the spinal cord on the

¹ Read before the Sections of Medicine and Neurology of the Australasian Medical Congress, Brisbane, 1920.

brain for its efficient stimulation and functioning, the less able is a portion of the cord separated from its higher controlling centre to carry on its work as a reflex centre. But this disability lasts only for a certain time, which varies with different circumstances and it is the variability of this period of time and the frequency with which patients with such severe lesions of the cord die at an early date after the injury which appear to have been responsible to some extent for the erroneous conclusions on the reflex activity of the divided spinal cord.

Now *a priori* one might expect that, if the spinal cord be completely transected by injury, there would ensue a partial descending degeneration down the pyramidal and extra-pyramidal tracts, the extent depending on the site of the transection and on the separation of the fibres from their trophic nerve cells; some degeneration from disuse would occur in the ascending paths in the divided segment. Holmes, however, states that in two cases of spinal injury in which the cord was examined microscopically, there was exceptionally little distant disturbance. In one case in which the cord was partially severed at the upper part of the second lumbar segment there were practically no pathological changes in either the grey or white matter below the second or above the first lumbar segment. I have not been able to find any account of a microscopical examination of the caudal segment of a divided spinal cord, but on Holmes's account of the absence of any degeneration in the cord at any distance from the site of the lesion, it is easy to understand how the caudal segment can retain its reflex functional activity. Collier has noted as a result of his examination of many cases of severe spinal injury, such as fracture-dislocation, compression and acute transverse myelitis, in which all the tendon jerks were abolished in the region supplied by the caudal segment of the divided spinal cord, that these phenomena occur in the absence of any recognizable structural change in the ventral horn cells, ventral roots and peripheral nerves of the paralysed region.

All authorities are agreed that in the early stage after a severe spinal injury or after an acute myelitis there is complete motor and sensory paralysis, with absent reflexes and interference with the sphincters of bladder and rectum, and that it is impossible when these symptoms are present to say whether the cord is completely divided, either anatomically or physiologically. There are no distinguishing characteristics of the symptoms at this stage and it is only after the lapse of a certain time, if the patient survive sufficiently long, that certain changes may take place in the symptoms and signs which may enable us to give a definite opinion on the condition of the cord at the site of the lesion. Three stages in the progress of these cases have been described.

During the first stage of complete transection of the cord the patient is suffering from spinal shock and not only is there complete motor and sensory paralysis in the region of the body below the level of the lesion, but there is also an absence of all reflex activity in the same region, no knee jerks nor ankle jerks, no abdominal, cremasteric nor plantar reflexes and there is retention of urine and faeces. During

this period, too, the nutrition of the skin is impaired and bed-sores readily form. The duration of this period is variable, but what determines this variability is not quite clear. Riddoch states that in three of his cases this stage lasted from one to three weeks and Holmes states that the reflexes are absent for from six to ten weeks. In one case under my own observation, in which a fracture dislocation of the spine occurred at the lower dorsal region as a result of a fall down stairs, the tendon jerks and superficial reflexes could not be obtained until after the lapse of five to six months from the date of the injury; then they gradually returned. But it must be recognized that this stage of absent reflexes may be indefinitely prolonged if muscular dystrophy sets in early. Collier states that the muscles waste and lose their faradic excitability, but that after long continued faradization of the lower limbs there may be a temporary return of the knee and ankle jerks by a renewal of the activity of the lumbo-sacral centres. In another case under my care many years ago of bullet wound of the upper dorsal region of the cord, there was at once complete loss of all motion and sensation below the level of the lesion, which persisted until the patient's death, nearly twelve months later. In this case there was no return of any reflex activity until shortly before his death, when a slight flicker of the knee jerk on both sides was obtained. In this case there was no reason to suppose the existence of any toxæmia, as his general health was good until he contracted whooping cough from his children; as he was not able to cough effectually and clear his bronchial tubes, he developed broncho-pneumonia and died from that. Now all are agreed that the muscles in the lower limbs become flaccid and toneless within two or three days after the infliction of the spinal injury, but the question arises: "Why is it that in some cases this condition persists and goes on to complete atrophy with no return of any reflex activity, while in other cases the flaccidity gives place to rigidity and return of the reflexes?" It is difficult to account for the muscular wasting and atony in view of what has been stated as to the anatomical intactness of the caudal segment of the cord, but it is quite clear that in those cases in which there is progressive trophic change in the muscles and, in fact, all the tissues, there must be some degeneration of the caudal segment extending to the lumbar enlargement. This appears to have been the view of the late Sir William Gowers. In cases of a complete, clean severance of the spinal cord, there is apparently not much distant degeneration (Holmes), but if the cord is crushed, as in fracture-dislocation or compressed by a missile or is the seat of an acute transverse myelitis, there is a much greater possibility of septic degeneration extending to the caudal segment, with thrombosis in the spinal blood vessels and consequent dystrophy of the cord. Another factor may be the spread of sepsis from the bladder, but, as cystitis is practically always present to a greater or less extent in all these cases, there seems no obvious reason why in one case sepsis should spread to the cord and not in another. No doubt strict care and attention in preventing the over-distension of the bladder in the early stages of the illness, with appropriate treatment of the

cystitis with vaccines, etc., may help considerably in limiting the amount of septic absorption. It must be remembered that these conditions were fulfilled in the treatment of Head and Riddoch's cases. We must, at any rate, recognize the fact that in some cases of complete transverse lesion of the cord this first stage may be indefinitely prolonged, that apparently the condition of spinal shock may pass insidiously into one of dystrophy of the caudal segment and no recovery of the reflex excitability of the region of the body supplied by the divided segment ensues.

The second stage is characterized by the return of reflex activity. After a variable period, as we have seen in some cases, there is a gradual return of the reflexes associated with a condition of spasticity in the lower limbs. And not only is there a return of the reflexes, but these become exaggerated in intensity, more easily elicited and accompanied by a more widespread disturbance than in normal persons. The first reflex to appear is the plantar and, although in some cases there may be at first a flexor response, yet subsequently or in some cases from the first the response is extensor in type and may continue to be of that character for an indefinite time. It was asserted by Collier in 1916 that an extensor response was a sign of an incomplete lesion of the cord; Holmes stated also that "clinical experience and *post mortem* examinations tend to show that during the first week or ten days at least after injury, the Babinski sign occurs only with transverse lesions which are incomplete." He further stated that the change in type of the response from flexor to extensor has in some cases been a precursor to improvement. There can be no doubt, however, from the later observations of Head, Riddoch and others that a persistent extensor response is found in a large percentage of cases in which a complete transverse lesion of the cord has been proved to exist. One of the patients whose case is recorded by Riddoch, has been under my care at the Randwick Military Hospital for the past two years; his spinal cord was completely divided by a shrapnel bullet four years ago and there is a well-marked Babinski reflex in the right foot. Claude and Lhermitte have also recorded a case of complete transection of the cord in the dorsal region by a shell splinter in which the plantar reflex on one side was extensor in type "contrary to what has been noticed in other cases and an extensor plantar response should therefore not be regarded as a sign of incomplete lesion."

Then we get a return of the knee and ankle jerks. The earliest date for the re-appearance of the knee jerks was the 21st day and the latest the 53rd day after the injury in Riddoch's cases; that is one to five weeks later than the re-appearance of the plantar reflex. The tendon jerks could be inhibited by inducing simultaneously a flexor reflex in the same lower limb; ankle clonus was not obtained. But it is quite certain that the date for the return of the knee jerks may be much later than that assigned by Riddoch in his cases. I have already mentioned that in one of my own cases it was over five months before the knee jerks could be obtained and in Claude and Lhermitte's case just referred to the knee jerks

did not return until six months from the date of injury.

Another special feature of the reflexes at this stage is the widespread response to a local stimulus. Thus a nocuous stimulus applied to the skin of the abdominal wall or any part of the lower limb may evoke not only a flexor spasm in the muscles of the abdominal wall and of the lower limb, but also evacuation of the bladder even if this viscus is not fully distended, and also sweating over an area of the body varying with the level of the spinal injury. At this stage also we get an automatic action of the sphincters of the bladder and rectum. If care be taken to prevent over-distension of the bladder in the early stages of the injury, the bladder may recover to such an extent that it can completely empty itself automatically and the importance of this fact cannot be overestimated in view of the danger of sepsis in residual urine.

Profuse sweating quite independent of any rise of temperature is another evidence of excessive reflex activity. It can be induced by such acts as passing a catheter, washing out the bladder or the administration of an enema. The area depends on the level of the spinal injury. But the sweating may be general all over the body if the patient is febrile from some accidental infection, such as a catarrhal cold or influenza or an extension of a cystitis or a pyelitis.

Another interesting feature at this stage is that, though bed-sores may readily form by slight friction or pressure, yet they can be healed completely, though the healing process is slow.

This stage may last an indefinite time. We have no evidence at present as to how long it may continue, but it is quite certain that patients may live on in comparative comfort for several years.

The third stage results from the development of septicæmia from bed sores or from the cystitis and pyelitis. The caudal segment of the cord now degenerates and loses all its functional activity as a reflex centre. The tendon jerks are all lost and the sphincters of bladder and rectum cease to act automatically. The bladder becomes over distended, the residual urine becomes foul and constipation becomes obstinate. The patient gradually sinks from general septicæmia.

I propose now to describe to you in some detail the present condition of a patient under my care at the Prince of Wales Hospital at Randwick, whose case has been fully described by Drs. Head and Riddoch in *Brain* (Vol. 40, Parts 2 and 3, page 273). This patient is now 32 years of age. He was wounded by a shrapnel bullet in the spine on August 6, 1916. He was at once completely paralysed below the level of the 6th rib. At a subsequent laminectomy the dura was opened and the spinal cord was seen to be completely divided opposite the bodies of the 5th and 6th dorsal vertebrae. The divided ends of the cord were separated by a distance of about 2.5 cm. An aneurysm needle was passed round the cord so as to corroborate the existence of a complete division. A shrapnel bullet was found imbedded in the body of the 6th dorsal vertebra and was easily removed. He remained under observation in London

for nearly a year and was then transferred to Sydney. He has been under my care for the past two years.

At present he is completely paralysed in all muscles of the legs and of the abdominal wall below the level of the 4th rib. Tactile sensations and pin pricks are not recognized below the level of the 4th rib, but deep pressure can be distinctly recognized as low as the 11th rib. Deep pressure over the abdominal viscera at any part does not give rise to any sensation of contact or of pressure. He gets a sensation at the epigastrium when he is hungry, but gets no discomfort from indigestion or any pain from the action of purgative medicines. He is not conscious of any discomfort when his bladder is full, but he has a momentary sensation of fullness in the throat (like what is commonly described as *globus hystericus*) and a sensation in the head when the bladder is about to empty itself. His bladder acts automatically and there is no dribbling of urine. The urine contains a small amount of pus and albumin, but is not offensive. It always shows some *Bacillus coli communis* infection and he has had vaccine treatment from time to time when his temperature has been raised in association with a condition of impaired general well being. His bowels are relieved every second day by enema, there being a good result each time, with no dribbling of water or faeces afterwards. The *sphincter ani* has good tone. There is, of course, no consciousness of the act of micturition or defaecation. He gets occasional erections of the penis with seminal emissions without any conscious sexual feelings.

Movements: involuntary. These consist in adduction of the thighs and legs, flexion of the legs on the thighs and occasional clonic contractions of the leg muscles. When he awakens in the morning his thighs are strongly flexed on the trunk and the legs flexed on the thighs and in a condition of strong spasm. In his bath this flexor spasm gives place to extensor spasm, the whole body becoming rigid in extension. When he first gets into his wheel-chair the legs frequently shoot out in extreme extension and the same result happens when he sits on his chair with pressure exerted by the edge of the chair or his air cushion on the backs of his thighs. An erection of the penis is frequently accompanied by a condition of general extensor spasm.

Reflexes.—Both knee jerks are very active and there is quite a definite thrust forward of the leg on the thigh. Patellar clonus can be quite easily elicited and is maintained for some seconds. Ankle clonus can be easily elicited on both sides; on the right side at first the contractions are slower and of larger amplitude than on the left side, but after a few contractions of this nature the clonus assumes its ordinary type. The clonic contractions are of quite a definite character and in every respect resemble the ankle clonus of ordinary lateral sclerosis. On stimulating the sole of the right foot a well-defined extensor response with eversion of the foot and partial separation of the toes is observed, but no contraction of any other muscles in the thigh or leg is observed. The extension of the big toe can be elicited by pricking any part of the leg below the knee or

by Oppenheim's method. There is no crossed plantar reflex. On stimulating the sole of the left foot there is adduction and slight inversion of the foot, but no extensor response. But the stimulation of the left sole is accompanied by flexion of the left thigh on the trunk and slight adduction of the thighs. No contraction of the muscles of either leg can be elicited by pricking the skin of the perineum, the penis or scrotum or upper part of the thighs. No reflex response can be obtained in the abdominal muscles by stroking the skin of the abdomen, but on attempting to elicit the cremasteric reflex, on stroking the skin on the inner side of the left thigh there is a movement of the umbilicus slightly upwards and to the right, while on stroking the skin on the inner side of the right thigh, the umbilicus moves upwards and to the left. These tests have been repeated several times, but always with the same result. There are no other signs of a "coitus reflex," if, indeed, these slight movements of the abdominal muscles can be regarded as forming any part of such a reflex.

The muscles of the thighs feel firm and well nourished; those of the right leg are in satisfactory condition, but those of the left leg are more wasted and fibrous. The skin is well nourished and there are some firm scars from previous bed-sores which have healed well. There is still a deep bed-sore over the sacrum, the edges of which are thickened and sodden; the base of the ulcer is formed by the bone of the sacrum. There is a slight purulent discharge from this sore, but it is clean and not septic. He has, of course, no sensation in this sore, but when the nurse packs the gauze too tightly into the cavity, he at once complains of discomfort, sweats a little and gets the same sensation in his throat as he does when the bladder is about to empty itself.

When the electrical reactions of the muscles were being tested, it was noted that in the early morning after a good night's rest practically all the muscles of both thighs and the muscles of the right leg contracted to a moderate faradic current, but no response was obtained in the muscles of the left leg. No response could be obtained to the galvanic current, even if a strong one were applied. The *rectus abdominis* also contracted to faradism, but not the oblique muscles. The contractility of all the muscles to faradism, however, appeared to become easily exhausted, for if he had been about much in his chair and there had been a good deal of involuntary movements in the legs, then no response could be obtained even with a strong faradic current in any of the muscles in which a good response had been obtained.

Diagnosis.—Head and Riddoch state that there are no manifestations by which we can be certain that the spinal cord has been anatomically divided. But this statement is hardly consistent with other observations which have been reported by Walshe and by the authors themselves. Head and Riddoch state that the knee jerk differs in one characteristic in those cases where there is a complete transection of the cord and in those in which there is a severe but not a complete transverse lesion of the cord. The knee jerks can be elicited with equal ease in both sets of cases, but in the former the jerk is a simple twitch

of the *rectus femoris* with a rapid relaxation of the muscle, while in the latter the jerk is more sustained, the relaxation phase of the response is slow and deliberate, due to the presence of postural tonus.

They further state that in complete transection of the cord a noxious stimulus applied to the sole of the foot causes a reflex in the corresponding lower limb, which is invariably uniphasic in character, *i.e.*, only one group of muscles—the flexors—is thrown into contraction. The extension which follows the contraction, is due entirely to a relaxation of the flexor muscles and to gravity. They further state that homo-lateral or bi-lateral extension of the lower extremities excited by noxious stimulation of the perineum or upper part of the thighs or by moving the prepuce over the glans of the erect penis and active extension of the lower extremities when the distal portion of the sole of the foot is pressed upwards, the limb having been first passively flexed (this corresponds to the extensor thrust described by Sherrington as occurring in decerebrate and spinal animals), never occurs in cases of complete transection of the cord. These statements are in accord with those of Walshe that the tonus of the extensor group of muscles depends upon intact extra-pyramidal tracts and if these are completely divided, then there is loss of tone in the extensor group of muscles and absence of the tendon jerks obtained from those muscles.

They further compare the clinical picture of a case of complete transection of the cord from a reflex point of view with that condition described by Babinski and Walshe as "paraplegia in flexion." But Walshe emphasizes the point that in "paraplegia in flexion" there is complete loss of tone in the extensor group of muscles and the knee and ankle jerks are greatly diminished or actually absent and there is no ankle clonus. This is in marked contrast with the greatly increased tone in the flexor muscles and the correspondingly increased hamstring jerks. It is assumed that when the injury of the cord is severe but not complete, the extra-pyramidal tracts retain their functional activity and so are effective in maintaining the reflex activity in the extensor group of muscles, but when the lesion of the cord is complete, these tracts being divided, we get loss of tone and of reflex activity in the extensor muscles.

Now these statements are inconsistent with that of Head and Riddoch that the knee jerks can be elicited with equal ease in both complete and incomplete lesions of the cord, although the character of the jerk may be somewhat different in the two cases. In the description of the course of the patient whose case is referred to as typical of a complete transverse lesion of the cord and whose present state I have just put before you, Head states in the note made 290 days after the injury that "on scratching the sole of either foot flexion occurred at the knee and hip, the ankle dorsiflexed and the toes went up. The flexor movement reached its height after the brief stimulus had been removed and then the leg slowly straightened. It was liable to end in extensor spasm." An extensor spasm is surely a very different thing from a condition of extension, the result of a relaxation of the flexor muscles plus the action of

gravity, as Riddoch describes the extensor movement after flexion in these cases.

Moreover, as I have already stated, in this patient extensor spasms are quite of frequent occurrence and the patellar and ankle clonus which are readily obtained on both sides, show the existence of muscle tone in the extensor group of muscles and this in the presence of what has been proved at operation to have been a case in which the spinal cord was completely divided, the two ends of the divided cord being separated by a distance of 2.5 cm.. We cannot, therefore, rely upon the absence of tone in the extensor group of muscles as indicating necessarily a complete transverse lesion of the spinal cord. But it is quite certain that there is a definite preponderance in tone and reflex activity in the flexor group of muscles in all cases of severe spinal injury. This was noted many years ago by Sir William Gowers, who, in speaking of spastic paraplegia, said: "In advanced cases the extensor spasm may be varied by attacks of flexor spasm, which at first occur chiefly during sleep, but after a time preponderate and may ultimately become permanent. This is always an unfavourable symptom, since for some reason not yet understood, this flexor spasm indicates a condition of the spinal cord from which recovery is rare."

In view of the facts I have already given it is quite clear that the definite statement by Riddoch and Walshe, "that one of the diagnostic points in complete transverse lesions of the cord is the absence of extensor spasms, while they are present in cases of incomplete lesions," does not hold good. Moreover, it can no longer be maintained that extensor tone depends upon intactness of the extra-pyramidal tracts and that if these be divided, postural or extensor tone is lost.

The conclusion to which we seem to be driven now is that the only symptom upon which reliance can be placed as indicating a complete transverse lesion of the cord is a permanent loss of all voluntary movements below the level of the lesion and a corresponding loss of all forms of sensation in the part of the body below the level of the lesion. If the lesion be high up in the dorsal region, a further confirmation of a complete lesion is the loss of all sensation from the abdominal viscera and loss of sensation of the functioning of the bladder and rectum. No reliance can be placed upon the condition of the tendon jerks or of the cutaneous reflex actions, nor on the presence or absence of tone in any one group of muscles, though an increased tone in the flexor group and a diminished tone in the extensor group of muscles most probably points to a complete transverse lesion.

Clinical Studies.

III.

WOUNDS OF THE COMMON FEMORAL ARTERY.

By George Bell, O.B.E., M.B., Ch.M. (Syd.),
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The operative treatment of recent wounds of the femoral vessels, despite their apparent ease of access, may be very difficult.

Two of the chief difficulties are: (i.) the impossibility in many cases of ascertaining before operation the exact site of the vascular lesion and (ii.) that of maintaining complete provisional control of hæmorrhage during operation.

Hæmatomata arising from wounds of the femoral artery, of its branches and in a few instances from wounds of the femoral vein are frequently of great size.

Makins (1) states that hæmatomata in connexion with wounds of the femoral artery and its branches reach the largest size of any in the body. Moreover, in my experience in those wounds of the common femoral artery close to the inguinal ligament a large amount of blood is frequently extravasated under that ligament into the retro-peritoneal tissues.

It can thus readily be seen that these large hæmatomata mask, as it were, the various portions of the femoral and external iliac vessels and render the exact pre-operative localization of the lesion difficult and at times impossible.

As regards the efficient control of hæmorrhage during operation, it is of extreme importance that this control be of a provisional or temporary nature. No permanent ligature should be placed on a main vessel or important branch until the exact site of the vascular lesion be found. The hæmorrhage may come from a wound of a branch and should a permanent ligature have been hastily applied to the main vessel it may be needlessly sacrificed and the risk of gangrene increased.

A large amount of hæmorrhage may take place even after the application of provisional means of control to the superficial and common femoral or external iliac vessels proximal and distal to the wound in the vessel. This blood is largely derived from the anastomoses of branches of the *profunda femoris* with branches of the internal iliac artery.

Moreover, it should be remembered that a high division of the common femoral artery is not infrequent and the circumflex arteries may arise directly from the common femoral artery.

I can recall at least one case of a wound of the common femoral artery where the internal circumflex artery arose directly from that vessel. Hæmorrhage from the femoral vein and its branches may be even more difficult to control than that from the arteries. I have found among the more difficult cases those wounds in the region of the origin of the deep femoral artery. The bleeding from veins in this region also may be extremely difficult to control.

Means of Provisional Control.

A tourniquet, when the position of the wound will permit of its application, should be applied proximally to the wound. One placed distally to the wound is often of use in controlling the venous circulation. Manual compression of the aorta might be tried, but it is a tiresome procedure and one requiring the constant attention of an assistant. Compression of the aorta by tourniquets applied round the waist has been used. I have only seen it used once and no harm resulted from it.

When the common femoral artery is involved, it is prudent to control the external iliac artery, that

vessel being exposed by an extra- or trans-peritoneal route and, when defined, being controlled by digital pressure or by one of the provisional methods described below. The most convenient method is by the application of a Crile's carotid clamp. It is much less likely to damage the vessel than other mechanical means, if applied with just sufficient pressure to stop pulsation in the vessel distal to it. In addition, it does not require the constant attention of an assistant.

Temporary control may be maintained by passing some coarse ligature or preferably tape beneath the vessel and by traction on it angulation of the vessel is produced and hæmorrhage controlled. Gordon Watson uses a method in which a tape is passed beneath the vessel and knotted by a single surgical turn over a piece of drainage tube of about the same calibre as the artery and placed upon its surface.

The Treatment of the Wound of the Vessel.

It is extremely important that the incision used to expose the vessels should be free and adequately expose them. Much time and blood may be wasted by working through a small incision. Briefly the means at our disposal are: Suture, the temporary maintenance of the circulation through a tube coated with paraffin, such as that of Tuffier, and, lastly, ligature.

Suture of wounds of these vessels will usually be confined to those cases where the wound is small, longitudinal and slit-like.

Tuffier's tubes have been used on a moderate number of cases and apparently with success in a few.

As a general rule ligature with complete division of the artery, so as to allow retraction of the divided end, will be the method of choice. It can be more rapidly carried out—a point of importance in the treatment of patients who have lost a considerable amount of blood. Moreover, it requires less assistance and less specialized apparatus.

Should both artery and vein be ligatured? Previous to the war the general opinion seems to have been that the main vein should be left intact and the venous circulation preserved.

Makins (1) discusses the matter at length and sums up the position as follows:

These considerations have led me not only to regard obligatory simultaneous occlusion of a main artery and vein as a negligible factor in the risk of gangrene of a limb; but to hold, further, that the procedure is preferable whether the vein be wounded or not, the result of the combined procedure being to maintain within the limb for a longer period the smaller amount of blood supplied by the collateral arterial circulation and hence to improve the conditions necessary for the preservation of the vitality of the limb.

In addition he quotes (i.) the remarks of M. Van Kend at the Inter-Allied Conference of Surgeons at Paris, May, 1917, and (ii.) also gives the conclusion adopted at that conference after discussion:

In carrying out a series of experiments made with the object of determining the indications and the physiological basis for transfusion of blood, I have had the opportunity of measuring the blood pressure in limbs of which the main artery had been ligatured. The blood pressure was taken successively after the artery alone had been tied and again when ligature of the vein had been superadded. My observations confirm the view that has been expressed by Sir George Makins; in fact, plethysmographic tracings demonstrate clearly that a slight rise in the blood pressure in the limb

follows the application of a ligature to a main vein, after previous ligature of the artery.

It appears, then, from the standpoint of the physiologist, that to leave the main vein viable after occlusion of the main artery of a limb diminishes what may be called the residuary blood pressure maintained by the collateral circulation. If the contribution of the collateral circulation is allowed to remain with the main vein intact, it is natural that the residuary blood pressure should fall. If this view be adopted, ligature of the vein, as well as the artery, should be recommended in order to retain the blood supplied in longer contact with the tissues. Thus the most satisfactory conditions for the maintenance of the nutrition of the organs are provided, because the obstacle to the return circulation provided by ligature of the vein retains the blood for a longer period in the member.

After discussion of the question at the meeting, the following conclusion was adopted: "Contrary to what has until now been believed, simultaneous ligature of both artery and vein, when both vessels have been wounded, does not give rise to increased risks of gangrene; in fact, it diminishes them. Facts tend to prove, even when the wound is limited to the artery, that simultaneous occlusion of the unwounded vein is to be recommended."

My experience was mainly confined to patients seen at a casualty clearing station. I have on two occasions not ligatured the femoral vein when I ligatured the common femoral artery and no ill result followed. However, as Makins remarks, it is difficult to exclude the occurrence of thrombosis of the veins after operation in these cases. Lastly I would urge the importance of having at hand means of rapidly replacing blood lost, when that amount is great, by transfusion of blood and in less severe cases by Bayliss's gum solution.

I have seen sufficient blood lost at operations on these vessels, even by operators of experience in this class of work, to endanger the patient's life when this loss follows a severe hæmorrhage prior to operation and unless this loss be rapidly made good, a fatal result is extremely likely to occur.

Reference.

Makins: "On Gunshot Injuries to the Blood Vessels," 1919; John Wright & Sons, Ltd., Bristol.

R.W., 15 years, was brought to Sydney Hospital by ambulance at 9.10 a.m. on July 14, 1920.

He was suffering from a wound in the left groin caused by a wicker worker's knife thrown at him from a distance of 6 feet about 8.30 a.m. on the same day.

The ambulance attendants stated that blood was spurting from the wound when they arrived. His clothes in the vicinity of the wound were saturated with blood.

The hospital record of his condition on admission was as follows: "Patient pale, collapsed, pulseless and has vomited. Temperature 95° F.¹ Respiration rate, 22 per minute."

Immediate treatment consisted of *rechauffement*, elevation of the foot of the bed and administration of fluids. Hypodermic injections of morphine (0.0075 grm.) were given at 9.30 and 10.30 a.m..

Briefly his condition during the day was as follows: 11.30 a.m.: Pulse, 108. Systolic blood pressure, 98 mm. Hg. (auscultatory method).

Noon: Red blood cell count (capillaries of ear),

¹ i.e., 35° C.

3,690,000 per c.mm.; hæmoglobin, 90%. Red blood cell count (vein), 3,760,000 per c.mm..

12.30 p.m.: Pulse, 120. Restless and complaining of great thirst.

2 p.m.: Pulse, 136. No external hæmorrhage. Patient has vomited. Extremities warm.

3.30 p.m.: Pulse, 144. Restless; still complaining of great thirst. Vomiting.

4.30 p.m.: Pulse 144. Systolic blood pressure 90 mm. Hg. (auscultatory method). No hæmorrhage from wound.

As the general condition of the patient was becoming progressively worse, despite the application of the usual restorative measures, it was decided to transfuse the patient with blood.

The brother of the patient, aged 17 years, was selected as donor after it had been ascertained that his blood corpuscles were not agglutinated by the serum of the patient.

About 5.45 p.m. 750 c.cm. of blood were transfused by means of a modified Kimpton's tube coated with paraffin. The pulse rate, immediately after transfusion, was 120 and the volume of the pulse "much improved." No pulsation could be detected in the left posterior tibial artery at the ankle. The supply of nitrous oxide being inadequate, ether was administered as a general anæsthetic at 6.30 p.m..

The wound, 1.9 cm. long, was situated immediately below the fold of the groin and just lateral to the line of the common femoral artery. There was a pulsating swelling in the vicinity of the wound and over this a well-marked thrill could be felt. An incision was made parallel to the left inguinal ligament and another incision continued at a right angle to this into the thigh. A pulsating mass of blood-clot was found in the superficial tissues.

The aponeurosis of the external oblique muscle was divided above the inguinal ligament. Examination then showed that the pulsating tumour extended a short distance above the inguinal ligament; it was, therefore, decided to expose the external iliac artery through a trans-peritoneal route rather than by an extra-peritoneal method, in which the peritoneum would be displaced medially. The upper portion of the divided external oblique aponeurosis was retracted medially, the sheath of the rectus was incised and that muscle retracted inwards. The nerves were preserved and the peritoneum incised. No blood was found in the peritoneal cavity, but there was a large extravasation of blood in the retro-peritoneal tissue of the left iliac fossa and of the pelvis in the vicinity of the bladder.

The proximal portion of the external iliac artery was exposed by dividing the peritoneum and by blunt dissection in blood-stained tissues.

A Crile's carotid clamp was applied to this vessel as a means of temporary control, Dr. Corlette, who was present, suggesting this means of provisional control.

The wound in the thigh was then excised as far as possible, the main vessels distal to it being controlled by digital pressure. Some of the cutaneous branches of the anterior crural nerve were found divided. The inguinal ligament was retracted upwards and the hæmorrhage was seen to come through an irregular wound in the main arterial trunk at the

junction of the common femoral and external iliac arteries and from a small wound in the adjacent vein. The wound in the vein was controlled by a lateral ligature. The artery was ligatured proximally and distally to the wound in it and about 1.9 cm. of the artery containing the wound excised. The Crile's clamp was then removed, the peritoneal incisions closed and the abdominal incision sutured in layers.

The wound in the thigh was sutured and a small drainage tube inserted into the subcutaneous tissue for 48 hours.

At 8.45 p.m. the pulse rate was 120 and the systolic blood pressure 130 mm. Hg.

At 8.30 a.m. on the following day the pulse rate was 114 and the systolic blood pressure 120 mm. Hg. The urine was normal.

During convalescence the highest temperature and pulse rate recorded were 37.7° C. and 116 on July 16, 1920.

The temperature did not rise above 36.3° C. after July 21, 1920, and on that date the pulse rate varied between 80 and 96.

There was a small amount of serous discharge from the wound, which was healed by August 10, 1920.

During convalescence the left lower limb did not become cold nor show any signs of failure of the circulation.

I could not detect pulsation in the left posterior tibial artery on August 15, 1920.

The patient resumed his usual work on September 13, 1920. Examination of the patient on November 3, 1920, showed that there was well marked pulsation in the left posterior tibial artery.

Examinations were made of the blood from the ear during convalescence and results of these are appended.

Patient.

July 15, 1920.—11.30 a.m.: 4,510,000 red blood corpuscles per c.mm.; hæmoglobin, 100%.

July 17, 1920.—3.30 p.m.: 4,050,000 red blood corpuscles per c.mm.; hæmoglobin, 80%.

July 22, 1920.—11.45 a.m.—4,550,000 red blood corpuscles per c.mm.; hæmoglobin, 90%.

July 24, 1920.—10.15 a.m.: 4,600,000 red blood corpuscles per c.mm.; hæmoglobin, 90%.

July 30, 1920.—2.30 p.m.: 4,900,000 red blood corpuscles per c.mm.; hæmoglobin, 100%.

August 3, 1920.—2.20 p.m.: 5,050,000 red blood corpuscles per c.mm.; hæmoglobin, 100%.

Donor.

July 24, 1920.—11 a.m.: 3,840,000 red blood corpuscles per c.mm.; hæmoglobin, 100%.

August 5, 1920.—11.30 a.m.: 5,160,000 red blood corpuscles per c.mm.; hæmoglobin, 100%.

Reviews.

A STANDARD WORK ON THE EUCALYPTS.

It is fitting that Messrs. R. T. Baker and H. G. Smith should mark their retirement from the positions they have held at the Technological Museum, Sydney, with so much honour to themselves and benefit to the community by the issue of a second edition of their monumental work, "A

Research on the Eucalypts."¹ When these authors started on their investigations some twenty-five years ago, a vast amount of work had been done on the botanical side of the subject, but comparatively little on the chemical and much of what had been accomplished was inaccurate and of little use. The collaboration of botanist and chemist was a particularly happy idea, since it meant that the materials, used by the chemist were always correctly identified. Many of the previous analyses were nullified by wrong or mixed material being employed. These investigators kept a record, whenever they made an analysis of an oil, of the species of eucalypt it came from, of the locality of growth and of the time of year when gathered. This was an onerous task, inasmuch as thousands of determinations were made, especially of the oil, from specimens obtained over one million square miles of territory, many of the species coming from almost inaccessible places and being distributed over a very restricted area. This research throws valuable light on the probable evolution of the genus. The lowest type in the genealogical tree is only distinguished from the cognate genus, *Angophora* (the so-called native apple), by the possession of the operculum or lid in the bud. Botanically and chemically they merge into one another.

The eucalyptus oils may be divided into four main groups: (a) those yielding a simple oil, consisting chiefly of the terpene pinene and resembling the oils of the *Angophoras*; (b) those yielding oils containing pinene and cineol or eucalyptol, phellandrene being absent; (c) those yielding mainly aromadendral, phellandrene being usually absent; (d) those yielding oils with the terpene phellandrene as chief constituent, piperitone being also usually present. The last group are particularly interesting, as the oils are those which have lately come to be used so much in the mineral separation processes, which have enormously increased the demand for such oils as that of *E. dives*. A remarkable fact brought to light by this research is the relation of the leaf venation to the oil constituents, species with particular forms of leaf giving oils belonging to one or other of the four groups. Another noteworthy observation is that species with pale-coloured or white timbers are confined solely to the south-eastern portion of Australia, the rest of the continent being given over to the red- or dark-coloured timbers, none of these extending any further south than the River Murray, thus showing their affinity for a tropical climate.

The main portion of the work is taken up with a description of the various species, their botanical characters and the chemical composition of their essential oils. About 178 species are dealt with, the material for the same species being often obtained from widely separated localities. Yet the authors have been more and more convinced, as they went on, of the comparative constancy of specific characters of eucalyptus species. Many previous workers in the field had thought that the eucalypts were most variable. It appears now that, while fluctuations of form may be seen according to soil, locality, etc., yet the extreme variability once claimed does not obtain.

The book is illustrated by numerous fine photographs, many of them in colour, depicting botanical material of the species, as well as microscopical sections of the leaves, showing distribution of oil glands. The fruits are adopted as the main means of differentiating the various species and in all cases are separately figured alongside the letter-press description. The latter part of the work is devoted to an exhaustive description of the chief organic substances found in the oils and the quantitative and qualitative methods adopted in their detection and separation. Many of these substances were first discovered and described by Mr. Smith himself. Finally, we have much useful practical information on the various methods adopted in eucalyptus oil distillation and the best leaf material to be used. This is illustrated by copious photographs and is a valuable guide to those engaged in the distillation industry, which is now a growing national asset. A careful perusal of their results leads us to recognize with the authors that in the genus eucalyptus Australia has a commercial forest asset of so diversified and valuable a nature that it has no compeer in any other genus in the whole botanical world.

¹ A Research on the Eucalypts, Especially in Regard to Their Essential Oils, by Richard T. Baker, F.L.S., and H. G. Smith, F.C.S.; Second Edition; 1920. Sydney: Published by Authority of the Government of New South Wales; Royal Svo., pp. 471, copiously illustrated.

The Medical Journal of Australia.

SATURDAY, MARCH 5, 1921.

The Public Hospitals.

In the Supplement to the *British Medical Journal* of January 1, 1921, there is a full report of a conference of representatives of the medical staffs of the voluntary hospitals of England and Wales and of the members of the Hospitals Committee of the British Medical Association. This conference was designed by the Council of the British Medical Association to formulate a policy in advance of the recommendations of a small sub-committee appointed by the Minister of Health "to inquire into and report upon the financial position of the voluntary hospitals throughout the country and to make recommendations." Every medical practitioner in the Commonwealth should read the report with care. The problems of the public hospitals in Great Britain are analogous to our own problems. The temper of the members of the medical profession is not dissimilar in the two parts of the Empire. The inclination of the sociologist and of the politician is the same there and here. There is much to be learned from the speeches as reported of the several members of the conference. These men represent all shades of sociological opinion. The extremist who sees in industrial unrest, in the world war, in the post-war revolution and in the ascendancy of the worker an indication of an entirely new order of social affairs, forgets that history repeats itself; that just as the struggle between the Roman plebs and patricians was waged fiercely for many years, until after an almost endless series of changes in form of government, something approaching an economic balance was restored by the victory of individual enlightenment over mass rights, so with each recurrence of this perennial contest the special set of attendant circumstances has led men to believe that a fresh problem has arisen. The speakers evinced a considerable degree of business acumen, unusual for members of the medical profession. Many were prepared to sacrifice principles for material benefit; some advocated an idealistic democracy,

as impracticable in its application as it is loose in its definition. Metaphorically summarized, it seems as though they propose to change the shape of the stock of a gun to suit a passing taste; they then favour a new, untried form of lock; later they would adopt a modification of the barrel. In this weapon they would insist on using the old form of cartridge, for they fail to recognize the significance of the sum total of the changes wrought. It will be noted that the term "voluntary hospitals" has been preserved throughout, notwithstanding the fact that the members have by a whittling process, gradually eliminated one function after another of the real voluntary institution. The resolutions on which the policy of the conference will no doubt be based, embody the following principles. The voluntary method of administration is to be maintained; State subsidy should be accepted only in times of financial stringency; employers of labour and insurance companies should contribute towards the upkeep of the hospitals; the hospitals should make provision for the necessitous person in need of medical care, for the person of small means during illness and for the worker. The care and treatment should be given gratuitously in the case of the necessitous person; the person of small means should contribute a sum proportionate to his means; while the worker should be able to claim hospital attendance as a right in response to the contributions paid regularly for this purpose. Accommodation should be provided in the hospitals for persons able to pay. The final resolution embodies the principle that of the moneys paid directly for the maintenance of patients a proportion should be handed to the medical officers for distribution among themselves. It will be recognized that these opinions represent a series of compromises rather than a consistent policy. We are unaware whether the British Medical Association will confirm the findings, modify them or reject them. Concessions both in fundamental principles and in details are often necessary. Usually they are advocated or accepted because the "other side" is strong enough to insist on the adoption of certain matters. The compromise is accepted in hope that ultimately the full reform will be adopted. The interim position does not satisfy either party and the reform usually breaks down. We view the proposals with dismay. Compared with the resolu-

tions of the Australasian Medical Congress, Auckland, 1914, confirmed and re-confirmed by the Federal Committee of the British Medical Association in Australia since that date, they represent an unwholesome departure from traditions of which the medical profession has been proud. It may be that the policy laid down by the Congress and by the Federal Committee is mid-Victorian, antiquated, ultra-conservative and obsolete. It may be that the millennium is at hand; when class distinction will disappear, when there will be no poverty, when every man will have equal rights and when every man will possess the same degree of intelligence. Charity may be a mistake; discipline and obedience to authority may be old-fashioned nonsense. The person who holds these views, cannot logically wish to preserve the voluntary principle. He must regard the hospitals as places where medical attendance is given to any citizen irrespective of his financial condition. The cost must fall on the community generally, that is, the payment must be made either from consolidated revenue or from local rates. In these circumstances the tradesman who provides the meat, is paid for his wares and the tradesman who provides medical attendance, is paid for his. In different parts of the world hospitals administered on this plan exist. The medical practitioners who accept the salaried positions, are, with some exception, men who have had limited experience of their profession. A few years of service of this kind usually leads to an unconscious deterioration.

In Australia to-day we have several kinds of public hospitals. The great teaching institutions in Sydney and Melbourne are recognized as hospitals for the gratuitous care and treatment of necessitous persons during illness or accident. The visiting members of the medical staffs give their services in an honorary capacity. That these positions are valued is because the public recognize that the best men are selected, because opportunities are offered for wide experience in the study of disease and because the holding of these positions is a condition precedent to appointment as a teacher at the Medical School of the University. But in addition to these attractions, every member of the honorary staff delights in rendering valuable services to the poor. In the next place we have hospitals which are government institutions. The gov-

ernment is responsible for the administration, maintenance and equipment of the institution. The appointments to the medical staff in Adelaide and in Brisbane are made by the Boards of Management on which the Governments have large representation. The honorary system is preserved and the well-to-do are not admitted to the public wards. In Tasmania there is no honorary staff and the hospitals are mismanaged by an incompetent Government. The fact that this Government found it necessary to pass a special Act of Parliament to legalize the registration of the Medical Superintendent of the Hobart Hospital after it has been shown that there was reasonable doubt whether the document purporting to be a diploma held by him was genuine, illustrates the form of degeneration that follows on the admission of all-in-sundry to a public hospital. There are State hospitals elsewhere in the Commonwealth of another kind. In some instances the appointment of the medical officers are made departmentally, without previous advertisement and without the selection of the best applicant by a competent committee of medical practitioners. Then there are the military hospitals, where excellent work is conducted by those who are instructed to carry out the duties as part of their service to the Empire. Under certain circumstances the conditions of admission to a hospital cannot be governed by the economic status of the patient. The necessity for isolation of persons suffering from some of the more dangerous communicable diseases and from mental diseases imposes on the State the duty of providing institutions of a totally different kind. The condition for admission to our public general hospitals is inability to pay for the necessary medical and nursing attendance elsewhere. As matters are at present, this principle is paramount. Equally important is it that the visiting medical officers of these public hospitals should receive no remuneration for their services. Recently the question has been raised in one or two small hospitals in country towns in New South Wales whether the members of the honorary medical staffs might receive fees for attendance on patients in affluent circumstances who are admitted to the hospitals and who contribute to their maintenance. This question may be considered again by the New South Wales Branch of the British Medical Association and the existing

policy may be reversed. But until such a step has been taken, the findings of the Federal Committee obtains that no honorary medical officers of a public hospital may accept a fee for attendance on a patient in the hospital. Well-to-do patients can be admitted to private hospitals or to paying wards or annexes attached to public hospitals. Where no private hospital and no paying wards exist in small towns, no serious objection would be raised to the utilization of the public hospital, provided that no necessitous patient is excluded from the institution as a consequence.

Mention should be made of the fact that in Great Britain national insurance has modified the conditions of the public hospitals. In other countries where national insurance has been adopted, the principle has been introduced of requiring every patient in a hospital to pay for his maintenance directly or indirectly through some recognized agency. The insurance societies, the poor law, the municipalities and the military authorities are the chief sources from which the maintenance fees of the patients are derived. In some circumstances the employers are called upon to meet the cost of medical attendance. In these circumstances no gratuitous attendance is given. In Australia we have as yet no national insurance and consequently this system would serve no useful purpose. Let us guard the charitable basis of our hospitals zealously and take every reasonable precaution to insure that the necessitous receive the best medical and nursing attendance in these splendid institutions.

A BUSINESS PROPOSITION.

The State sometimes embarks in commercial ventures and usually fails where private enterprise succeeds. The failure occurs notwithstanding the advantages of financial security, adequate equipment and partial or complete monopoly. There are, no doubt, many reasons for the usual failure. The majority of them are to be sought in the want of commercial training of those in responsible places in the governmental world. It needs but little keenness of observation to desery that one of the fundamental faults in governmental undertakings is the failure to profit by the experience of successful firms of business men. Our greatest industries are managed by

experienced business men, with the aid of expert scientists, whose duties include a continuous research into the processes involved. Chemists, engineers, biologists, mineralogists and experts in other sciences are paid handsome salaries by industrial firms in order that new processes may be discovered, that improvements in existing methods may be introduced, that economic losses may be reduced and that industrial risks may be eliminated. The State has one legitimate commercial undertaking, that of safeguarding the health of the community. In the past this business has been carried on in a most unbusinesslike manner. There has been no effort to secure the best brains to advise the controlling authority in regard to the application of knowledge already acquired and to add to that knowledge, so that improved methods may be introduced in the future. In this business of safeguarding the public health, the State offers a small stipend to a limited number of experts in hygiene. There is no inducement to tempt the brilliant medical graduate to turn his attention to the most important function of a medical practitioner, that of preventing disease. At times the State, by sheer good fortune, commands the services of an enthusiastic expert, whose love for his work is so strong that the meagreness of the financial reward does not deter him from devoting his energy to this service. Altruists are, however, relatively uncommon and the State has no right to take advantage of exceptions. The experts in administration are indifferently paid and are consequently few in number. But the experts in research in State employment are so underpaid that we are forced to the conclusion that the value of their services is wholly unrecognized. If this business of preserving the health of the citizens of the State were run on sound lines, the whole system would be quite different. It would be recognized that the power to prevent disease or to stamp out an existing disease from a community has a very high economic value. The up-to-date department of preventive medicine would inform the public the annual cost to the State and to the individual of diseases such as tuberculosis, diphtheria, enteric fever, pneumonia, syphilis and so on. The amount of money lost as a result of illness and death from these causes is so great that a large expenditure is justified in the campaign to prevent them. Success cannot be anticipated by squandering

money. Intelligence, favourable condition of investigational work, enthusiasm, competition and highly-trained technical ability are needed. To tempt men and women to enter the field and to expend all their energy in the various branches of this form of work, prospects must be offered which will compare with those of general practice. Careers should be open to brilliant students who would enter at a reasonable living wage and work their way upwards until they reach positions commanding high salaries, comparable to those paid by commercial firms to the experts who enable them to conduct their businesses to advantage. Facilities should be provided for the gradual development of skill and for the continued acquisition of expert knowledge. The number of persons employed in this work should be large, partly because so much work awaits the doing; partly because exceptionally valuable work is more probable when large numbers are engaged than when there are but few investigators; partly because there is no greater stimulus to best endeavour than competition. While it should be recognized that the work is immensely difficult and even the best research workers may labour without result for long periods, the workers should be subjected to critical control and only the best should be enabled to climb to places of responsibility and worth. Communal service and research work belong either to the State or to richly-endowed institutions. In Australia we have no John D. Rockefellers. The State must undertake the business or it will go undone. It is a sound proposition and if properly conceived and well planned, it must prove a good investment.

THE CARRIER PROBLEM IN DIPHTHERIA.

In the prophylaxis of diphtheria it is of fundamental importance to ascertain with a high degree of accuracy the available sources of infection. Epidemiologists frequently neglect to distinguish between foci of bacilli and foci of infection. It is unnecessary to accentuate the significance of this differentiation. To follow the trail of a harmless bacterium is waste of time and money and may involve much additional labour before the true source of infection is discovered and destroyed. Moreover, if the general practitioner is to carry out his part in the large scheme of energetic preventive medicine, the responsible authority must be cognizant of all the possible false scents and must be able to guide the practitioner's attention to the situations where the guilty members may be discovered. In the campaign against a common infective disease, it is a mistaken policy

to place reliance on methods of immunization until measures have been taken to trace the outbreak back to its source and to render all centres of infection powerless to maintain it. In the case of diphtheria the issues are relatively simple. No case of infection can arise in the absence of diphtheria bacilli in the immediate environment of the individual. There is overwhelming evidence that the main source of infection is a person suffering from clinical diphtheria. The degree of danger to a healthy community of susceptible individuals of a person suffering from a mild attack of the disease, not severe enough to necessitate nursing in bed, has not been definitely ascertained. Still less information is available concerning the risk associated with contact with so-called carriers of diphtheria bacilli. It is necessary to bear in mind in this connexion that antitoxin has no appreciable effect on the infecting bacilli. A patient treated with diphtheria antitoxin often harbours bacilli in his pharynx or nares for a considerable time after recovery. Many persons apparently immune to the disease carry diphtheria bacilli in their oral or nasal cavities for long periods. It is usually assumed that these carriers are capable of spreading infection, although the justification for this assumption is lacking. Drs. J. Gelien, W. L. Moss and C. G. Guthrie have endeavoured to supply some important information touching these points.¹ In the year 1911 they reported that among over 2,500 individuals in the city of Baltimore, 89 were found on a single examination to be harbouring diphtheria bacilli in their throats. This represents 3.35% of the total number. Later they carried out a bacteriological examination of the mucus of the throats of 800 children attending one of the schools and they discovered *Bacillus diphtherie* in 85 or 10.62%. A re-examination of the same children disclosed that in 75 of those who were found at the first examination to harbour bacilli, no bacilli were found at the second examination. Further, in addition to the ten children from whose fauces diphtheria bacilli were recovered at both examinations, there were 59 in whom diphtheria bacilli were found at the second examination but not at the first. They claim to have a considerable amount of evidence in support of the view that the failure to detect bacilli at the first or second examination was not caused by a real absence of bacilli. The bacilli recovered in this way were virulent in no more than 11.11%. Further studies were conducted in connexion with the children found to be carriers. Fifty children were selected for this purpose. Bacilli were detected on each of six subsequent examinations in only two children. In four the bacilli were detected five times; in seven three times and in eight twice. In the remaining 29 children, no bacilli were found on the first or any subsequent examination in 13, while in 16 the bacilli were found only at the first re-examination. The bacilli isolated at the first examination were virulent in 12.76% of the cultures; the bacilli of 10.9% of the cultures obtained at the subsequent examinations were virulent. In some cases virulent bacilli were recovered at the first examination and avirulent bacilli at the second or subsequent examination in the same child.

¹ Bulletin of the Johns Hopkins Hospital, November, 1920.

while in other instances avirulent bacilli were discovered at first and virulent bacilli later. The authors argue that there is absolutely no evidence that the same strain undergoes change in virulence in these cases; indeed, there is reason to conclude that these are instances of a second or double invasion. A careful inquiry elicited the fact that of 160 carriers of diphtheria bacilli, only 11 had previously had diphtheria. In every one of these 11 children, the illness dated at least three years before the examination. Fourteen of the children had been exposed to infections at periods varying between one and twelve years previously. None of the children infected any of their associates during the period of observation and as far as could be ascertained no infections had spread from them prior to the examinations. Other points of significance to the epidemiologist have been worked out by the authors. From these observations and records and from a series of experiments conducted with a view to the determination whether diphtheria antitoxin prevented diphtheria bacilli from finding a home in the fauces of a previously healthy animal, it appears that the average healthy carrier of diphtheria bacilli cannot be regarded as a serious source from which infection might spread. The authors maintain that avirulent bacilli cannot give rise to clinical diphtheria. The opinion has been expressed on many occasions in these columns that virulence is a fixed quality of a bacterium which is by no means readily altered. The majority of carriers harbour avirulent organisms and are consequently harmless to susceptible children. If these lessons can be accepted, we return to the doctrine to which we claim adherence, that the "previous case" is the real source of infection in diphtheria.

THE TREATMENT OF OSTEOMALACIA.

Osteomalacia has been recognized for about one hundred years, but there is still considerable lack of information concerning the causes of the peculiar pathological changes. The older conceptions of Virchow, Cohnheim and others have been preserved merely as working hypotheses. No reliance is now placed on these views. Indeed, it is presumed by the majority of modern pathologists that osteomalacia is a deficiency disease and that more information is needed before the peculiar relationship between the aetiological effect of a diet lacking an unknown food factor and the essential changes in the bones and the ductless glands can be satisfactorily explained. Recent researches have revealed in association with this condition a somewhat unexpected alteration of the metabolism. According to the majority of investigators there is a steady loss of calcium, phosphorus, sulphur and nitrogen and a compensatory gain in magnesium. The excess of phosphorus, sulphur and nitrogen excreted over the amount ingested is so minimal that it is not believed that the disturbance of the metabolism of these elements is in any sense essential. The loss of the body in calcium obviously corresponds with the diminution of calcium in the affected bones. From the analyses

carried out by several investigators, it would appear that the metabolism of calcium is disturbed to a varying degree in the different instances of osteomalacia and that even in a single patient, the rate of loss is by no means steady or constant. It has been shown, however, that some loss of calcium takes place in all cases and at all stages of the disease. The record of the amount of calcium taken in as food and of the amount excreted in the urine and faeces may therefore be used as a reasonable guide in assessing the value of treatment. Dr. H. A. Freund and Dr. B. C. Lockwood have seized the opportunity of investigating the effect of the exhibition of various extracts of glands of internal secretion in a patient under their care.¹ In the first place they determined the loss of calcium and also studied the magnesium metabolism, in order to establish a working standard for comparison. The calcium loss without treatment was lower than that observed in other cases. The analyses were conducted with great care and sources of error were excluded as far as the present-day bio-chemical methods permit. They were surprised to find that instead of recording a compensatory storage of magnesium, there was a small but distinct excess of excreted magnesium over that ingested. While they make no attempt to explain this aberrant behaviour, they find it advisable to utilize their figures as a control in estimating the effect of treatment. The patient was given extract of thyroid gland three times a day for seven days. The loss both of calcium and of magnesium increased under this therapy. They then exhibited 1 c.cm. of pituitrin night and morning for seven days. The calcium loss increased considerably, while the loss of magnesium became lessened beyond the level determined before the experimental treatment was instituted. During this time the patient's condition was not improved. In the following seven days the patient was given 6.48 mgr. of extract of desiccated parathyroid gland. At the end of the period there was a considerable accumulation of calcium and of magnesium. Unfortunately they were unable to watch the patient for a longer period under this therapy. A short time after the week's trial with parathyroid extract, both ovaries were removed as there was no improvement in the patient's clinical condition. A fortnight later the metabolism of calcium and magnesium was again studied for seven days. It was then found that the loss of calcium was considerably greater than at any previous stage and that there was a slightly greater loss of magnesium. The patient was much worse a year later. The authors were restricted to some extent in their investigations. It would have been more valuable had they allowed several weeks to elapse between each therapeutic experiment, although this would have necessitated a repetition of the control metabolism analyses. Although the data are insufficient for the purpose of drawing far reaching conclusions, the experiments indicate the necessity of continued and repeated trial with extract of parathyroid gland under the guidance of the curves of the calcium and magnesium metabolism.

¹ *Annals of Medicine*, April, 1920.

Abstracts from Current Medical Literature.

PATHOLOGY.

(85) Lethargic Encephalitis.

Simon Flexner discusses the differential diagnosis of lethargic encephalitis, poliomyelitis and Australian X-disease (*Johns Hopkins Hospital Bulletin*, July, 1920). A comparison of the lesions in poliomyelitis and encephalitis lethargica brings out four essential facts of difference: (i.) The location is dissimilar; in poliomyelitis the spinal cord, medulla and pons suffer most. The grey matter further anteriorly usually escapes and the cortex is infrequently involved. (ii.) While lymphocytes, plasma cells and even polyblasts are found in the lesions of poliomyelitis, the polymorphonuclear leucocytes play a more prominent part than in encephalitis. (iii.) The meninges are far more infiltrated with cells in poliomyelitis. This probably explains the greater changes present in that condition in the cerebro-spinal fluid. (iv.) Finally, in poliomyelitis neuronophagocytosis, in the spinal cord especially, is a very common phenomenon, whereas in encephalitis it is met with only infrequently. Poliomyelitis is readily transmissible to monkeys through inoculation with the affected central nervous tissues; lethargic encephalitis is either not transmissible at all or only rarely and with difficulty. There is a third epidemic disease of the central nervous organs described in detail by J. B. Cleland, who has sent the author tissues from fatal cases in man, and from inoculated animals. It prevailed in New South Wales, Victoria, and Queensland during 1917 and 1918 and was highly fatal. Several hundred cases were reported. At first the disease was regarded as epidemic poliomyelitis, but the majority of the cases did not show the usual spinal cord involvement and few instances of typical flaccid paralysis of the extremities were noted. The age distribution of cases resembles that of poliomyelitis; the mortality (70%) is far higher than in that disease, but the seasonal incidence is the same, viz., late summer and early autumn, while lethargic encephalitis has thus far prevailed in the winter period. The pathological changes in the spinal cord in Australian X-disease resemble those of epidemic poliomyelitis. Cellular infiltration of the blood vessels and the interstitial tissues and neuronophagocytosis are striking. The monkey is readily infected by inoculation with the affected nervous organs of man. So far, then, there is similarity between Australian X-disease and poliomyelitis. But whereas no one has succeeded in communicating poliomyelitis to sheep, calves or horses by inoculation, Cleland believes that he has infected these animals with Australian X-disease. This ready communicability of Australian X-disease to animals distinguishes it not only from poliomyelitis,

but also from encephalitis. The author has been enabled to study tissues from cases of Australian X-disease in man, monkey, sheep, calf and horse. The nervous lesions in man and the monkey are similar to those of poliomyelitis. There is no analogy in these lesions in the other animals. Brain tissues, not spinal cords, of the other animals were sent to the author by Cleland. They show mononuclear cell invasion of the meninges generally and of the blood vessels in the cortex and a certain extrusion of similar cells in the grey matter about the affected vessels. The evidence then of a meningo-encephalitis of mononuclear variety is convincing. There is one question which may be raised regarding the results of experiment inoculations, viz., whether in the infection of the sheep, calf and horse, (the inoculations were made from infected monkeys) a second and extraneous pathogenic micro-organism might have been accidentally introduced. Briefly, the author regards epidemic poliomyelitis as a disease caused by a specific inciting micro-organism and marked by a special pathologo-anatomical foundation in the central nervous organs. He considers it probable that lethargic encephalitis will be found to occupy a similar special category, while he is inclined to reserve judgement respecting Australian X-disease which he thinks may possibly be discovered to be a somewhat special instance of epidemic poliomyelitis in which the brain rather than the spinal cord has had to stand the greater shock of the attack.

(86) Experimental Bilharziosis.

In the *Journal of Pathology and Bacteriology* (June, 1920), Hamilton Fairley records the results of his investigations into bilharziosis and contrasts the experimental lesions in monkeys with those hitherto described in man. He states that the various pathological lesions produced by *B. mansoni* and *B. hematobia* are dependent on the different habits of the adult parasites of the two species and not on differences in the local inflammatory response of the tissues of the host which is identical for both species. The ova-producing capacity of *B. hematobia* appears to be much greater than that of *B. mansoni*. The habitat of the worms of *B. mansoni* is the hepatic and portal veins, the superior and inferior vena cava. In the case of *B. hematobia*, while worms also occur in these situations, the pelvic plexuses of veins are those mainly inhabited and, as these plexuses drain into the inferior vena cava, it is not surprising that worms of *B. hematobia* are found in the pulmonary arterioles at autopsy. The distribution of both terminal and lateral spined ova in the tissues of the body is generalized. In the case of *B. mansoni* the maximum deposition of ova occurs in the liver, colon and ileum, while in *B. hematobia* it occurs in the bladder, uterus, lung, liver and colon. The pathological picture in monkeys dying before ova are deposited in the tissues (i.e., within five weeks of in-

fection) is characteristic and indicative of an acute toxæmia, the brunt of which is falling on the parenchyma of the liver, the spleen and the cortical epithelium of the kidney. The lesions observed after the sixth week are characterized by the appearance of pseudotubercles in the various viscera and perhaps by the appearance of definite papillomata. Microscopically a typical bilharzia tubercle is found to be composed of one or more centrally placed ova with adjacent giant-cell systems. Surrounding these is a dense cellular zone composed of eosinophilic polymorphonuclear cells and small mononuclear cells. Identical lesions may be observed in man in the earlier stages of infection. Special emphasis needs to be placed on the constant occurrence of hepatic involvement in both *B. hematobia* and *B. mansoni* infections. Bilharzia pigment occurs in Kupffer's cells in both species of infection and in its physico-chemical characters resembles closely, or is identical with, malaria pigment. It possesses neither the physical nor the chemical properties of melanin. There is a definite relationship between the cellulohumoral response in experimentally infected monkeys and the prognosis. In hyperinfected monkeys dying within five weeks there was a constant leucopenia, absence of eosinophilia and no complement fixation reaction. In monkeys surviving the sixth week of infection there was constantly present an eosinophilic leucocytosis associated with a positive serological reaction.

(87) Adenomyomata.

A preliminary paper by Thomas S. Cullen on the distribution of adenomyomata containing uterine mucosa appears in the *Johns Hopkins Hospital Bulletin* (July, 1920). The article in full together with about fifty original illustrations will shortly appear in the *American Medical Association's* new surgical journal—*The Archives of Surgery*. The author has been amazed at the widespread distribution of adenomyomata consisting of a matrix of non-striped muscle and fibrous tissue with typical uterine mucosa scattered throughout it. He has found them: (1) In the body of the uterus. (2) In the recto-vaginal septum. The clinical picture in these cases is typical. In the early stages the patient complains of pain before or at the beginning of the menstrual period and especially during defecation. On bimanual examination, a small nodule is felt directly behind the cervix. (3) In the uterine horn or Fallopian tube. (4) In the round ligament. (5) In the ovary. (6) In the utero-ovarian ligament. (7) In the utero-sacral ligament. (8) In the sigmoid flexure. Cullen records the case of a young woman who had an advanced adenomyoma of the recto-vaginal septum. At operation a puckered tumour was found partially encircling the sigmoid near the pelvic brim. It looked like a cancer. On histological examination it proved to be an adenomyoma. The condition is extremely rare. (9) In the left rectus muscle. (10) In the umbilicus.

PÆDIATRICS.

(88) Pneumococcus Peritonitis in Infancy and Early Childhood.

Pneumococcus peritonitis is rather a rare disease amongst infants and young children. Of 171 cases of general peritonitis in hospital practice, P. W. Beaven (*Amer. Journ. of Dis. of Children*, October, 1920) found only nine which had been proved bacteriologically to be of pneumococcus origin. The disease involves the whole peritoneal cavity. Adhesions form limiting the process and finally causing a localized abscess. In this respect it differs from other forms of purulent peritonitis seen in children. Infection undoubtedly occurs through the blood stream. In seven of the nine cases studied, distinct pulmonary symptoms preceded the peritoneal inflammation. Two were apparently idiopathic. Clinically, therefore, two types of case occur: (1) that which is clearly secondary to pneumonia or empyema and (2) that which is apparently primary. In group (1) three of the seven cases gave no definite clinical evidence of peritoneal inflammation and in these cases all, or nearly all, of the serous membranes were affected. In the remaining four cases peritonitis was the only complication of the pulmonary involvement and the children lived until abdominal distension was present or until complete recovery occurred. The onset of the peritonitis was not marked in any of these cases by definite abdominal symptoms. Prior to the time when distension was noted, there was no tenderness, rigidity, pain or vomiting. After the onset when adhesions were forming, there were moderate fever, abdominal enlargement and occasional vomiting attacks. Palpation sometimes disclosed the presence of one or more masses in any part of the abdomen. Tuberculous peritonitis had to be excluded. Treatment should be expectant. In the author's opinion, until abscess formation occurs. Death usually occurs from associated conditions. The two cases in group (2) both ended fatally. In this type there is an abrupt and strong onset, resembling the peritonitis of streptococcal origin, from which it is clinically indistinguishable. In acute appendicitis the temperature is lower and the symptoms are not as acute. Treatment resolves itself into the administration of morphine until localization occurs, when the resulting abscess or abscesses should be opened.

(89) The Feeding of Normal Infants.

In opposition to those who hold conservative views on the subject of infant feeding Stafford McLean (*Medical Record*, November 6, 1920) considers that the average infant will thrive better on a liberal and varied diet and that he will be stronger and more active, will walk earlier and will have a better colour and musculature and that there will be an earlier closing of the fontanelles and earlier dentition. Orange juice is given at three months of age and replaced at twelve months with strained apple sauce and prune

pulp. An exclusive milk diet up to the age of 12 months is undesirable, chiefly because the amount of iron present is small and because a large bulk is necessary, if milk containing sufficient calories be given. After the sixth month part of the infant's caloric needs should be supplied by means of other food than milk. The extra food should be increased in amount, while the milk is reduced in quantity from 840 c.c.m. at six months to 600 c.c.m. at eighteen months. Feeding with cereals should be begun at about the fifth month in the form of a teaspoonful daily of strained oatmeal jelly, increased at the tenth month to three tablespoonfuls twice a day. Eggs may be fed at the sixth month, one fourth of the pulverized, well-boiled yolk being given daily. This is mixed with vegetable or cereal until a whole yolk is given daily. At twelve months a whole scrambled egg may be given, if tolerated. At seven months a teaspoonful of steamed carrots or spinach may be given daily and increased at twelve months to three tablespoonfuls daily. These vegetables supply in large amount the vitamins necessary for growth and health and for sustaining the appetite. Spinach is especially valuable in this respect.

(90) Empyema in Infants and Young Children.

Reviewing the total number of cases of pneumonia and empyema among patients admitted to a children's hospital (the majority were under three years of age), R. C. Spence (*Amer. Journ. of Dis. of Children*, December, 1920) found that approximately 11% of the pneumonia patients either had empyema on admission or developed it later. Cases were classed as empyema when pus or cloudy serum was obtained by exploratory puncture from the pleural cavity. The age of the infant was found to be the principal factor in determining the prognosis. Of 20 patients under six months of age, 75% died; of 53 under one year, 64% died; while of 29 over three years of age only 13.8% died. Males developed empyema more frequently than females, but their mortality was slightly lower. When the symptoms were of short duration the mortality was very high, due no doubt to a greater intensity of infection. In the later cases the mortality was also high, due probably to neglect. The author considers that in every acute respiratory condition in infants, flatness or percussion should be the sign for exploratory puncture, while displacement of the heart, when present, is of great diagnostic importance. The condition of the breath sounds is of doubtful value. The pneumococcus was present in 70% of the cases in pure culture and in this group the mortality was lowest. With mixed infections and streptococcal infections the mortality was the highest. No conclusion as to prognosis could be drawn from the leucocyte count, which, also, was of little value in the differentiation between pneumonia and complicatory empyema. The majority of the pa-

tients were treated by siphon drainage. In 29 cases simple incision between the ribs with rubber tube drainage was employed. Rib resection was the primary operation in only nine cases. In 24 cases the only treatment was aspiration and in these 24 cases the infants were so acutely ill that it seemed unwise to do more. Two children who had had multiple aspirations, recovered without other surgical treatment. The best results with siphon drainage were obtained when treatment could be maintained without interruption for as long as a week. Such interruption might be due to plugging of the tube by fibrin masses or to air leakage round the tube caused by faulty technique. Siphon drainage favours early and easy lung expansion, even in infants with their soft thoracic walls and feeble respiratory muscles. Amongst the fatal cases only four did not present some serious complication of the pulmonary condition. In more than one third of the fatal cases death was probably due to prolonged sepsis and to imperfect expansion of the lung, though drainage was perfect in all. Unless accumulation of fluid in the pleural cavity was very rapid, it was considered advisable to delay operation until the acute pulmonary inflammation had subsided, but aspiration was performed for temporary relief.

(91) Dental Sepsis in Children.

Carious teeth may cause malnutrition and anaemia with retarded mental and physical growth. Gastro-intestinal diseases are common. Glands in the drainage area of decayed teeth become readily enlarged, fibrosed and eventually tubercular. Sepsis in deciduous teeth causes hypoplasia of the permanent set, setting up a gingivitis which affects the periodontal membrane of the permanent tooth. Because of these facts, F. St. J. Steadman (*Lancet*, February 7, 1920) advocates wholesale extraction of deciduous teeth with the infected pulp. Cleansing and filling is useless because the pulp eventually suppurates and dies with the result that the teeth remain tender and mastication is imperfect. The antagonist should also be removed, as it is functionless and debris collects round it, causing gingivitis. In cases in which the four lower deciduous molars are carious as well as the first upper, but not the second, the latter are left in position until the permanent molars have erupted and occluded. As a general rule extraction of teeth does not adversely influence the growth of the jaw and extraction from one side or from the upper and not from the lower jaw does not lead to a lop-sided appearance or to inferior or superior protrusion. It is said that early extraction of the deciduous teeth leads to a mesial movement of the 6 year molar, thus causing crowding and irregularities later on. This occurs if the teeth are extracted before the permanent molars appear and can be met by extracting one of the permanent teeth in each corner of the mouth, either the four 6 year molars or the four premolars.

Medical Societies.

MELBOURNE HOSPITAL CLINICAL SOCIETY.

A meeting of the Melbourne Hospital Clinical Society was held in the lecture room of the Hospital on November 26, 1920. The President, Mr. Basil Kilvington, conducted the meeting.

Dr. S. V. Sewell demonstrated the case of a man with a spinal tumour. For twelve months the patient had been the subject of pain in the left lower abdomen, radiating towards the mid-line. For the past four months he had been under increasing disability in following his occupation. He had noted that, in addition to difficulty in using his left leg, he seemed to lose knowledge of the position of the limb. Dr. Sewell had first seen the patient three weeks prior to the date of the meeting and on that occasion considered that he presented a definite symptom-complex. The left posterior column did not appear to be conducting at all, as the sense of active and passive position was absent, there was no appreciation of gross vibrations and no discrimination of the distance between points. Sensibility to touch, pain and temperature in the left leg was good. At the level of the twelfth dorsal, first and second lumbar segments and confined to these segments gross analgesia was apparent; there was no hyperæsthesia. In these areas touch was appreciated if slight pressure were employed, but the epicritic sensibility was defective. In the opposite limb there was loss of sensation to pain in the peripheral distribution corresponding to the second, third and fourth sacral segments, with complete analgesia over the area of the first sacral segment. All the lumbar segmental areas on this side appeared not to be affected. Thus, the only crossed fibres implicated were the sacral fibres in the opposite antero-lateral tract. That the motor tracts were definitely involved on the left side was apparent from the exaggeration of the deep reflexes and the presence of a definite extensor plantar reflex.

Dr. Sewell pointed out that the features in this man's case were those of a Brown-Séquard syndrome, with the lesion at the level of the first lumbar segment. At the time of the first examination very slight rigidity of the spinal column was detected. The patient had experienced some difficulty in commencing the act of micturition. The Wassermann test, applied to the blood serum, at this time yielded a negative result. Progress had been rapid. At the second examination Dr. Sewell had found definite evidence of involvement of the tracts in the right side of the cord, as well as those of the left side, in the shape of marked impairment of posterior column conduction and the extensor nature of the plantar response. The patient at this stage was affected with complete retention of urine. An examination of the cerebro-spinal fluid showed that, while there was no excess of cells, the globulin content was slightly raised and the fluid gelatinized readily. There was no response with the cerebro-spinal fluid or with the blood serum to the Wassermann test.

Dr. Sewell said that the point for consideration was whether the tumour was entirely extra-medullary at the level of the first lumbar segment or whether there existed an intra-medullary lesion of the left side of the cord, involving the nerve roots after their entry and extending across to the opposite side. He found it difficult to reconcile the signs of involvement of the afferent tracts with the presence of an entirely extra-medullary lesion. These tracts were singularly resistant to pressure from without the cord; he had been very much impressed with this fact by an instance in which the cord had been compressed into a "tape" and yet the posterior columns had retained their functions to a remarkable degree. He was of opinion that an exploratory operation should be performed. There had been a steady progression in the signs and symptoms during the last two weeks and, further, the level of the lesion was very definite and of easy access.

In conclusion, Dr. Sewell mentioned that at the outset, pending the pathologist's report on the result of the Wassermann test, the patient had been given two grammes iodide of potash three times a day and an injection of salvarsan.

Dr. Konrad Hiller expressed his interest in the case. He had no doubt but that the lesion was at the level of the twelfth dorsal or first lumbar segment. Pain had been a

leading symptom at first and therefore it was probable that the lesion was extra-medullary. He agreed as to the necessity for operation, in view of the rapid advance in symptoms and signs.

Mr. Alan Newton said that he would be prepared to explore at once; the condition was spreading and the onset of retention of urine had already added to the gravity of the prognosis. Regarding the nature of the lesion, the rapidity of spread was much greater than that characterizing the endotheliomata usually met with in this situation. These tumours were usually slow in their extension, but might be multiple. He recollected a patient in whom three such tumours occurred at different levels of the cord; all were successively removed, although their extirpation necessitated the resection of fourteen laminae. It was interesting to note that so many laminae could be removed without serious impairment of the function of the spinal column. In operating in these cases, Mr. Newton expressed his preference for local anaesthesia, especially when the area involved was at the higher levels of the cord. The advantage was the great reduction in the amount of bleeding, which ordinarily was very troublesome.

Dr. Sewell said that he thought it not improbable that a malignant growth was present, into which hæmorrhage had occurred during the last 10 or 14 days.

Dr. Paul Dane exhibited a male patient, aged 35, who had been wounded in the mid-occipital region of the skull in May, 1916. As the direct result of the wound the patient was rendered unconscious for two days and subsequently suffered great impairment of vision, from which he recovered completely at a later date. At the present time the man displayed great rigidity of the neck, left arm and left leg and a "Parkinsonian" fixity of facial expression. The pupils were equal and reacted to light and to accommodation. There did not appear to be any muscular paralyses, but in the left arm contracture at the elbow to 95° had occurred and there was also contracture of the thumb at the metacarpo-phalangeal joint. All the movements of the arm were slow and weak and a fine rhythmical tremor was apparent in the muscles of the forearm. Great rigidity was noted in the left lower limb in whatever direction movement was attempted. The tendon reflexes, while unusually active on the right side, were very much exaggerated on the left and on this side the plantar response was of a flexor nature. A coarse tremor was apparent in the muscles of the left leg.

Dr. Dane remarked that, "in lieu of anything better," he had provisionally designated the case as "traumatic paralysis agitans." The man was very emotional. X-ray examination of the skull failed to reveal any foreign body. The patient's walk was not that of a hemiplegic. As a rule, hemiplegia occurring in a man of 35 years was susceptible of considerable improvement. This patient had not improved at all, in spite of prolonged and persistent treatment, psychic and otherwise, directed towards improving the mobility in the affected arm and leg.

Dr. H. Hume Turnbull was of opinion that the man's disabilities were of a functional nature and suggested that movement of every kind in the affected limbs should be encouraged.

Dr. S. V. Sewell agreed with Dr. Turnbull in his assessment of the condition as functional. He thought that relief would be best attained by the use of suggestion; the patient would in all probability be very resistant and it would require patience and determination to overcome his resistance, which would be best accomplished in one long sitting.

Dr. Sewell stated that if there were an organic lesion present, it must be situated in the left superior cerebellar peduncle. He referred to a case within his own experience, in which a vascular lesion in this situation caused clinical signs and symptoms identical with those in Dr. Dane's patient. Dr. Gordon Holmes had reported a series of cases resembling *paralysis agitans*, due to lesions of the superior cerebellar peduncle. All the patients presented homolateral lesions and flexor responses and all exhibited ataxia. It was difficult to conceive of war wounds resulting in the lesion indicated. He considered the case under discussion to be an instance of a not uncommon type of functional hemiplegia, in which the patient perpetuated the tremor on the side affected.

Dr. Dane, in reply, emphasized that the functional element in his patient had not been overlooked. Treatment on functional lines had been prolonged and persistent; relaxation,

persuasion and other psycho-therapeutic measures had all been practised. He felt convinced that the trouble was organic, but after hearing the views put forward he would again try treatment on a functional basis.

Dr. Dane's second patient was a man who provided a history of accidents. In the first instance, some years ago he had been bitten by a snake on the right forefinger, which he promptly chopped off. At a later date he lost a finger of his left hand and, following a third accident to his head, he had suffered much neuralgic pain in the scalp. The patient had been abroad on active service and had received a wound with fracture of the lower end of the right radius. After his return, and while at work on the wharf, he experienced a sudden severe pain in the right elbow. This was followed by a very severe "tic," consisting of extremely violent, convulsive movements of the right arm, flexor in character. Treatment by hypnotism resulted in considerable diminution in the violence of the movements, but still a residuum remained and the flexor nature of the movements was unaltered. The man was hypnotized again and the movements were changed to the extensor type. The movements still persisting were of that nature. The next stage in the treatment was the institution of voluntary movements, simple at first and later more complicated. At the present time there was still a little "tic," but the patient could thread a needle. Dr. Dane remarked that it was not unusual for patients of this type to improve considerably under hypnosis, with, however, a residuum of persistent trouble.

Mr. Basil Kilvington read the notes relating to a young woman in whom gall stones had recurred after a former operation for their removal. The first operation was performed in 1914 and was undertaken for an apparently typical case of gall stones. One remarkable feature noted at that time was that the gall stones threw a shadow by radiographic examination. In order to exclude the possibility of a renal calculus, Mr. Newton had catheterized the ureters and injected collargol as a preliminary to pyelo-radiography. At the first operation, Mr. Kilvington had found stones in the gall bladder, but none was demonstrable in the ducts. Cholecystostomy was performed and a drainage tube left in the gall bladder.

The patient had remained free from symptoms for nearly six years, but recently had sought treatment at the hospital on account of pain and indigestion of three months' duration. There was no jaundice accompanying these symptoms.

Mr. Kilvington operated a second time and again found numerous stones in the gall bladder. No calculi were found in the ducts during the course of a thorough exploration. Numerous adhesions in the neighbourhood of the foramen of Winslow were embarrassing for the operation of cholecystectomy; the operation was therefore completed by providing for drainage of the gall bladder.

Mr. Kilvington remarked that hitherto the recurrent gall stones in his experience had always been in the ducts. Under these circumstances he had been in doubt whether one or more stones in the ducts had been left behind at the original operation. It was improbable, however, that such an event would occur in dealing with stones limited to the gall bladder, as there was no difficulty in making sure that this viscus had been completely cleared of calculi.

Mr. B. T. Zwar said that the case of Mr. Kilvington's patient raised a moot point, around which there had been much discussion, *viz.*, whether cholecystostomy or cholecystectomy was the better procedure in operating for gall stones. Cholecystostomy had been the operation of choice in the Melbourne Hospital for some years past. He could not recollect any instance of recurrence of gall stones after this operation. On the other hand, he had knowledge of three patients in whom gall stones had recurred after the operation of cholecystectomy. In all three exploration of the duct had been easy and satisfactory and the actual performance of the operation left nothing to be desired. In one of the cases to which he had referred, gall stone colic occurred two years after the removal of the gall bladder and typical gall stones were found in the motions. In the other two, the return of symptoms was shown to be due to the presence of stones in the common bile duct.

Mr. Zwar recognized that it was not possible to lay down hard-and-fast rules regarding the relative merits of the two operations. He favoured cholecystostomy. Operation

after cholecystectomy was likely to be very difficult; he had experienced extensive adhesions and anatomical distortion in dealing with gall stones which had recurred after removal of the gall bladder. He wished to emphasize the point that cholecystectomy did not obviate recurrence of gall stones, which undoubtedly could form in the bile passages.

Mr. Alan Newton's experience had been different from that of Mr. Zwar. Repeated instances of recurrent gall stones after cholecystostomy had led him to remove the gall bladder as the operation of choice.

Dr. Wm. Dismore Upjohn, O.B.E., referred to a patient who, eight years after the removal of the gall bladder, passed a gall stone *per rectum*. That it was not a solitary calculus was evident from its faceted surfaces.

Mr. Basil Kilvington said that he had seen a number of examples of recurrence of gall stones in the bile passages after cholecystectomy. He commented on the difficulty of diagnosis; chronic pancreatitis, a degree of which might be expected, frequently confused the issue.

Dr. H. R. Dew exhibited some excellent examples of museum work in specimens illustrating enlargement of the prostate. (i.) An enlarged prostate, associated with which were multiple vesical calculi. (ii.) A prostate with enlargement of the middle and lateral lobes, but with no posterior enlargement, such as could be detected by rectal examination. (iii.) A prostate with slightly enlarged middle lobe. In this specimen were seen two diverticula of the bladder, which Dr. Dew regarded as acquired rather than congenital. Congenital diverticula were very constant in their situation, near the ureteric orifices. (iv.) A prostate with middle lobe enlargement leading to a general elevation of the internal urethral orifice. The specimen showed the surgical capsule very well. (v.) A fibro-adenoma of the prostate, removed supra-pubically from a patient whose history of urinary trouble dated back eight years. (vi.) A prostatic carcinoma removed supra-pubically of atypical clinical character, in that it was not very hard. A microscopic section disclosed a scirrhous carcinoma. (vii.) A single villous papilloma of the bladder, palpable *per rectum* and subsequently shown to be malignant. At a supra-public operation, the base was cauterized on account of severe hemorrhage, but sloughing ensued and led to para-vesical supuration.

The specimens exhibited by Dr. Dew evoked much interest and stimulated discussion by the surgeons present on some points in the operation of prostatectomy.

THE OPHTHALMOLOGICAL SOCIETY OF NEW SOUTH WALES.

A meeting of the Ophthalmological Society of New South Wales was held in the Sydney Hospital on November 3, 1920, the Vice-President, Dr. F. Guy Antill Pockley in the chair.

Dr. F. Guy Antill Pockley reported his further experiences of the case of vernal catarrh described at the last meeting (see *The Medical Journal of Australia*, January 15, 1921, page 58). He had since decided to perform a tarsectomy. He had removed the tarsus and the mucous membrane covering it in one piece, making the incision well above the granulations. The condition had recurred at a higher level and the irritation was worse than ever. The operation had been performed after an attempt had been made for a period of five years at every other form of treatment.

Dr. E. C. Temple Smith described a case of persistent pupillary membrane. The membrane was complete and not merely formed of strands. He asked for the opinion of members present on the question of surgical interference.

In the discussion Dr. R. H. Jones and Dr. J. C. Halliday advised leaving the condition alone. Dr. Guy Pockley was of opinion that a knife might be passed behind the membrane, dividing it from behind forwards.

Dr. Temple Smith demonstrated a case of blindness in a little girl eight and a half years of age, whose left eye had been totally blind for a period of six days after she had received a blow on the head. The child was rather delicate, but of a bright and cheerful disposition. The eye appeared normal, and the pupillary reactions were present and this fact had raised his suspicions. When the right

eye was bandaged she was unable to walk without colliding with objects in her path; flicking the fingers before her left eye did not make her blink, nor did she flinch when Dr. Smith pretended to poke his finger in her eye. He tested her sight with red and black letters, which she could easily read. These observations showed that the case was one of hysterical blindness and the patient had since recovered her vision perfectly. In the discussion members agreed that the condition was hysterical.

Dr. J. C. Halliday described a case of new growth in the anterior chamber. The patient was a girl of twelve years. Three years previously her left eye had been injured with a stick. She recovered and there was no marked impairment of vision. Two and a half years ago the sight in that eye began to fall again and the failure of vision was still progressing. The outer and upper portion of the anterior chamber was filled with a pearly, lobulated mass. The upper and outer portion of this growth was creamy-white in colour. The lens was still *in situ*. He invited members to give an opinion on the diagnosis.

In the discussion some of the members were of opinion that the condition was a cyst of the iris; others believed that it was a growth of the nature of a hydatid.

Dr. F. Guy Antill Pockley exhibited a patient suffering from *retinitis pigmentosa*. He was 35 or 36 years of age and his sight had been falling during the last four years. Vision was less than $\frac{1}{60}$ and Dr. Pockley was of opinion that it could not be corrected. The patient could read ordinary print. There was no gross contraction of the visual field. The disc had the dirty, greyish appearance which was commonly seen in cases of *retinitis pigmentosa*. Examination of the disc also revealed fine, pigmentary hæmorrhage which was more marked towards the periphery of the fundus. An interesting feature of the case was that both macular regions were encroached upon by the pathological changes in the fundus. A large, dark spot was also visible on ophthalmoscopic examination, which was at first believed to be a neoplasm. Closer examination, however, proved that it had definite hæmorrhagic edges. There was a failure to respond to the Wassermann test. In regard to the family history, the patient's grandfather had been blind and the mother's sight was impaired to about the same degree as the sight of the patient.

In the discussion Dr. R. H. Jones was at first of opinion that there was no hæmorrhage in the left eye, but after examining the right eye, he was convinced that hæmorrhage was present in the left. He also noticed a large area of atrophy round the disc.

Dr. Halliday remarked that the pigmented patches were of small size and that this fact was in favour of the diagnosis of *retinitis pigmentosa*.

Corrigendum.

We are requested by the Council of the Victorian Branch of the British Medical Association to call attention to an error in the List of Members of the Branch, published as a supplement to our issue of February 5, 1921. In preparing the list the Secretary of the Branch inadvertently entered the name of Mr. Hamilton Russell as the Representative of the Branch in the Representative Meeting. No appointment to this office has yet been made.

Naval and Military.

APPOINTMENTS.

The following announcements have been published in the *Commonwealth of Australia Gazette*, Nos. 15 and 16, of February 17 and 24, 1921:

Citizen Naval Forces of the Commonwealth.

ROYAL AUSTRALIAN NAVAL RESERVE (SEA-GOING).

Transfer to Retired List.—The appointments of the following Officers as Sub-District Naval Medical Officers are terminated and that they be transferred to the Retired List on the closing down of the Naval Reserve Districts of Maryborough (Queensland) and Cairns:

Surgeon-Lieutenant William Gilbee Brown, M.B., Ch.B., Maryborough.

Surgeon-Lieutenant Philip Sylvester Clarke, M.B., F.R.C.S., Cairns.

The appointments of the following Officers as Sub-District Naval Reserve Medical Officers are terminated and that they be reverted to the Retired List on the closing down of the Naval Reserve Sub-Districts at the ports shown opposite their respective names:

Surgeon-Lieutenant-Commander Francis Henry Vivian Voss, Rockhampton.

Surgeon-Lieutenant Ernest Harris Beaman, Bundaberg.

Surgeon-Lieutenant James Henry Sleeman, Portland.

Surgeon-Lieutenant Martin Moylan Lyons, Port Fairy.

Australian Military Forces.

The undermentioned being appointed to the Reserve of Officers with the substantive rank equivalent to that held by them in the Australian Imperial Force, as follows, dated 1st October, 1920:

First Military District.

To be Captain—

Thomas Montague Mansfield.

Second Military District.

To be Majors—

Colin Chisholm Ross.

Donald Stuart Mackenzie, D.S.O.

Wallace Mervyn Alfred Fletcher.

Alan Sinclair Darvall Barton, D.S.O.

Stephen Bruce Burge.

Claude John Tozer, D.S.O.

Hubert Richard Joseph Harris.

Robert Maxwell McMaster, D.S.O.

Eustace William Ferguson.

Sydney Michael O'Riordan, M.C.

Australian Army Medical Corps—

Colonel K. Smith, C.M.G., to be transferred to the Unattached List, 1st February, 1921.

Reserve of Officers—

Honorary Captain W. R. Tomlinson to be granted the temporary rank and pay of Major whilst employed at No. 4 Australian General Hospital, 1st July, 1920.

Third Military District.

Australian Army Medical Corps—

Major W. H. Summons to be transferred to the Unattached List, 1st January, 1921.

Captain (Honorary Major) L. J. C. Mitchell to be transferred to the Reserve of Officers and to be Major, 1st January, 1921.

Honorary Captain G. A. Birnie, from the Reserve of Officers, to be appointed Captain, 1st January, 1921.

The resignation of Captain W. A. Spring of his provisional appointment is accepted, 31st January, 1921.

Reserve of Officers—

The temporary rank of Major granted to Honorary Captain E. N. Scott is terminated, 14th September, 1920.

Fourth Military District.

Australian Army Medical Corps—

The temporary rank of Lieutenant-Colonel granted to Major A. W. Hill is terminated, 18th January, 1921.

The temporary rank of Major granted to Captain R. L. Kenihan, M.C., is terminated, 29th December, 1920.

Captain R. W. Clento to be transferred to the Reserve of Officers, 31st October, 1920.

Reserve of Officers—

The temporary rank of Major granted to Honorary Captain N. R. Bennett is terminated, 26th December, 1920.

84th Military District.

Reserve of Officers—

The temporary rank of Major granted to Honorary Captain E. A. Rogers is terminated, 20th December, 1920.

LODGE PRACTICE IN VICTORIA.

The attention of members of the Victorian Branch is drawn to a short annotation published in *The Medical Journal of Australia* of February 19, 1921, page 157. The Council of the Branch wishes to notify the members that they must not make any arrangements with the secretaries of either the Ancient Order of Foresters or the Hibernian Australian Catholic Benefit Society until formal permission has been received from the Secretary of the Branch.

DEATH CERTIFICATES.

The Government Statist of Victoria has addressed the following letter to the Secretary of the Victorian Branch of the British Medical Association:

As many death certificates issued by medical practitioners are incomplete with respect to the duration of illness, may I ask that you will be so good as to direct the attention of your members to the omission and request them to see that certificates are issued in as complete a form as possible.

The question of the duration of last illness is very important, not only in connexion with our statistical work, but also in respect to certificates of death issued to life assurance societies. Where the exact period cannot be given definitely, a statement as to the approximate duration will be very acceptable.

Walter David Keith Craig, Esq., M.B., Ch.M., 1919 (Univ. Sydney), of Abbotsford Road, Homebush, has been nominated for election as a member of the New South Wales Branch of the British Medical Association.

W. L. Nickson, Esq., M.B., Ch.M., 1920 (Univ. Sydney), of Royal Prince Alfred Hospital, Camperdown, has been elected a member of the New South Wales Branch of the British Medical Association.

We regret to announce the death of Dr. A. A. Brown, late of Greenvale Sanatorium for Consumptives, which occurred at Essendon, Victoria, on February 23, 1921.

Correspondence.

THE VENEREAL DISEASES ACT IN NEW SOUTH WALES.

Sir: In connexion with the practical working of the above Act, there are one or two minor considerations which may tend to militate against its usefulness which Dr. Molesworth omits in his letter in your issue of February 26.

The "document prescribed" mentioned in notification form as having been given to the patient, is rather a formidable looking, bulky booklet which contains the whole Act, regulations, and schedule, and information to doctors and patients together with hints on syphilis and gonorrhoea jumbled together; one or two patients have refused to take it—one, a married man, saying it would give him away if found, another, a railway man, giving the reason that all he wished to know was on the wall notices in the departmental lavatories.

Another patient refused treatment when he noticed on last page the heading "special warrant to constables" (Form K.).

As a suggestion for the Commissioner's consideration the issue to practitioners of small inconspicuous leaflets separately for syphilis and gonorrhoea, to be given to patients, might be advocated, together with the admirable lists of "don'ts" on back of each.

Another difficulty in the country is to follow up "swagmen," drovers, etc., who so largely make up the number of venereal disease patients.

As regards the pecuniary advantages to the profession mentioned by Dr. Molesworth, I am afraid that will hardly be realized, as such patients are usually and in fact proverbially forgetful of their obligations, whilst the inadequate fee of 2s. 6d. for private and 1s. for hospital notifications may be partly swallowed up by postage, if the four notices have to be sent, and compares very unfavourably with the 3s. 6d. fee paid for the notification of infectious diseases with its much lesser attendant writing.

As far as one knows, local country hospitals have as yet received no special financial aid for facilities to treat such cases, which, from the point of view of the future nation, would be far better spent than in weird "motherhood" schemes.

Relatively to population, there has been a large increase of disease in country centres, which formerly was always imported from the cities and our best efforts should be used to work this Act—cumbersome and irksome as it may at first appear—so as to cope in some way with its occurrence.

Yours, etc.,

LLEWELLYN W. ROBERTS.

Cowra, New South Wales,

February 27, 1921.

Books Received.

INTRODUCTION TO GENERAL CHEMISTRY: AN EXPOSITION OF THE PRINCIPLES OF MODERN CHEMISTRY, by H. Copaux; translated by Henry Leffmann, A.M., M.D.; 1920. Philadelphia: P. Blakiston's Son & Company; pocket size, pp. 195, with 30 illustrations.

FRENCH-ENGLISH MEDICAL DICTIONARY, by Alfred Gordon, A.M., M.D.; 1920. Philadelphia: P. Blakiston's Son & Company; Royal 8vo., pp. 161. Price, \$3.50 net.

ON DISEASES OF THE LUNG AND PLEURE, INCLUDING TUBERCULOSIS AND MEDIASTINAL GROWTHS, by Sir R. Douglas Powell, Bart., K.C.V.O., M.D., F.R.C.P., D.Sc., LL.D., and P. Horton-Smith Hartley, C.V.O., M.A., M.D., F.R.C.P.; Sixth Edition, 1921. London: H. K. Lewis & Company, Limited; Demy 8vo., pp. 798, with 36 plates and other illustrations. Price, 42s. net.

SYPHILIS AND VENEREAL DISEASES, FOR STUDENTS AND PRACTITIONERS, by C. F. Marshall, M.D., M.Sc., F.R.C.S., and E. G. French, M.D., Ch.B., F.R.C.S., being the Fourth Edition of "Syphilology and Venereal Disease"; 1921. London: Baillière, Tindall & Cox; Demy 8vo., pp. 433, with 9 coloured and 90 other illustrations. Price, 25s. net.

LUNACY IN INDIA, by A. W. Overbeck-Wright, M.D., M.P.C., D.P.R.; 1921. London: Baillière, Tindall & Cox; Demy 8vo., pp. 406. Price, 21s. net.

THE POCKET ANATOMY, by C. H. Fagge, M.B., M.S., F.R.C.S.; Eighth Edition; 1920. London: Baillière, Tindall & Cox; Foolscap; pp. 313. Price, 5s. net.

AIDS TO PATHOLOGY, by Harry Campbell, M.D., B.S., F.R.C.P.; Fourth Edition, 1920. London: Baillière, Tindall & Cox; Foolscap; pp. 248. Price, 4s. 6d. net.

AIDS TO DIAGNOSIS AND TREATMENT OF DISEASES OF CHILDREN, by John McCaw, M.D., L.R.C.P.; Fifth Edition, 1920. London: Baillière, Tindall & Cox; Foolscap; pp. 404. Price, 6s. net.

GENERAL PRACTICE AND X-RAYS: A HANDBOOK FOR THE GENERAL PRACTITIONER AND STUDENT, by Alice Vance Knox, M.B., B.Ch., with chapters on instrumentation by Robert Knox, M.D., C.M., M.R.C.S., L.R.C.P.; 1921. London: A. & C. Black, Limited; Crown 8vo., pp. 214, with 32 full page plates and 56 illustrations in the text. Price, 15s.; by post, 15s. 9d. net.

MANIC-DEPRESSIVE INSANITY AND PARANOIA, by Professor Emil Kraepelin, of Munich; Translated by R. Mary Barclay, M.A., M.B.; Edited by George M. Robertson, M.D., F.R.C.P.; 1921. Edinburgh: E. & S. Livingstone; Demy 8vo., pp. 280. Price, 21s. net.

ON BONE FORMATION: ITS RELATION TO TENSION AND PRESSURE, by Dr. Murk Jansen, O.B.E.; 1920. Manchester (at the University Press): Longmans, Green & Company; Royal 8vo., pp. 114, illustrated. Price, 20s. net.

A HANDBOOK OF SKIN DISEASES AND THEIR TREATMENT, by Arthur Whitfield, M.D., F.R.C.P.; Second Edition, Revised; 1921. London: Edward Arnold; Demy 8vo., pp. 291, with 56 plates. Price, 18s. net.

THE TREATMENT OF DISEASES OF THE SKIN, by W. Knowsley Sibley, M.A., M.D., B.C., M.R.C.P., M.R.C.S.; Third Edition; 1920. London: Edward Arnold; Demy 8vo., pp. 248, with 24 plates. Price, 12s. 6d. net.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

The undermentioned have been registered, under the provisions of *The Medical Act of 1867*, as duly qualified medical practitioners:

Baldwin, Alec. Hutcheson, M.B., B.S., Univ. Melb., 1917; D.P.H., 1920, Brisbane.

Bouvier, Frederic Albert, M.B., B.S., Univ. Melb., 1918, Children's Hospital, Brisbane.
 Burnell, Glen Howard, M.B., B.S., 1916, M.D., 1920, Univ. Adel., Brisbane.
 Illingworth, Harold Thorburn, M.B., Ch.M., Univ. Syd., 1920, Toowoomba Hospital.
 Uren, Cecil, M.B., Ch.M., Univ. Syd., 1919, F.R.C.S., Edin., 1919, Mount Morgan.

Medical Appointments.

Dr. C. G. Moffitt, Senior Resident Medical Officer at the Mental Hospital at Kenmore, New South Wales, has been appointed to the position of Medical Superintendent.

Dr. Annie L. Robertson has resigned her appointment as Medical Officer in the Department of Public Instruction of New South Wales.

Dr. Crawford C. Marshall (B.M.A.) has been appointed Public Vaccinator at Harrow, Victoria.

Drs. E. B. Thomas (B.M.A.) and G. C. H. Nicol (B.M.A.) have been appointed Medical Officers at Neales and Walkerie, South Australia, respectively, to attend to destitute persons and aborigines.

Dr. Glen H. Burnell (B.M.A.), late Acting Surgeon Superintendent of the Broken Hill and District Hospital, has been appointed to the staff of the Australian Hookworm Campaign.

Dr. George William Macartney, D.S.O. (B.M.A.) has been appointed Government Medical Officer at South Grafton, New South Wales.

Dr. Alexander Christie McArthur has been appointed Government Medical Officer at Grafton, New South Wales.

Dr. C. O. F. Rieger (B.M.A.) has been appointed certifying surgeon for the county of Yancowinna, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xxv.

Government of Tasmania: Medical Officer for the Hydro-Electric Department.

Isisford District Hospital, Queensland: Medical Officer.

Royal North Shore Hospital of Sydney: Honorary Assistant Surgeon in Charge of Orthopaedic Department.

The National Association for the Prevention and Cure of Consumption, Sydney: Honorary Assistant Physician.

Croydon District Hospital, North Queensland: Medical Officer.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Institutes or Medical Dispensaries. Manchester Unity Independent Order of Oddfellows. Ancient Order of Foresters. Hibernian Australian Catholic Benefit Society. Grand United Order of Free Gardeners. Sons of Temperance. Order of St. Andrew. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Australian Natives' Association. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIA. (Hon. Sec., 6 Bank of New South Wales Chambers, St. George's Terrace, Perth.)	All Contract Practice Appointments in Western Australia.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

Mar. 8.—Tas. Branch, B.M.A.
 Mar. 8.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.
 Mar. 11.—Q. Branch, B.M.A., Council.
 Mar. 11.—S. Aust. Branch, B.M.A., Council.
 Mar. 15.—N.S.W. Branch, B.M.A., Council (Quarterly).
 Mar. 16.—W. Aust. Branch, B.M.A.
 Mar. 17.—Vic. Branch, B.M.A., Council.
 Mar. 17.—N.S.W. Branch, B.M.A., last day for return of ballot papers for election of the Council.
 Mar. 18.—N.S.W. Branch, B.M.A., Annual General Meeting.
 Mar. 22.—N.S.W. Branch, B.M.A., Council.
 Mar. 25.—Q. Branch, B.M.A., Council.
 Mar. 30.—Vic. Branch, B.M.A., Council.
 Mar. 31.—S. Aust. Branch, B.M.A..

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated. All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney. (Telephone: B. 4685.)